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FOREWORD

This is the text of three seminars that were presented to the Commissioners and staff of the Canadian Transport Commission during the Fall of 1983. The Commission makes these papers available as a further contribution to the continuing discussion of the development of transportation policy and regulation in Canada.

The seminar by Richard Goss, Professor of Maritime Economics and Administration, the University of Wales Institute of Science and Technology, raises some of the fundamental aspects of seaport policies. Within the context of the legislation establishing Ports Canada, the discussion addresses the basic principles on which ports' policy in Canada can be developed to the country's advantage.

Paul Earl, Assistant Coordinator, Grain Transportation Authority, describes the grain handling and transportation systems which have evolved for controlling the movement of Western Canadian grain from country positions to export and domestic markets. In reflecting on this overview, he identifies some of the key shortcomings in the system as it presently exists.

The presentation by Pierre Franche, President and Chief Executive Officer, VIA Rail Canada, is a discussion of the special problems and corporate goals of VIA. These topics are considered within the context of VIA's role as a Crown corporation and within the evolving nature of this concept.

It must be taken for granted that the opinion expressed in these papers are those of the respective authors and do not necessarily reflect the views of the Canadian Transport Commission.

Yves Dubé
Vice-President (Research)

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POLICIES FOR CANADIAN SEAPORTS

by Richard Goss
of the Department of Maritime Studies,
University of Wales Institute of Science
and Technology

Cardiff and Ottawa-Hull, 1983
Presented to the Canadian Transport Commission on September 1, 1983

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Chapter 1

SUMMARY

This paper was prepared, largely during the summer of 1983, at the invitation of the Canadian Transport Commission, Ottawa - though it was I, not they, who chose the subject. This seemed both appropriate and opportune; partly because I had studied the subject a few years before and partly because the Canada Ports Act 1982, provided for a thorough reorganization. Chapter 2 explains these points at greater length.

Chapter 3 defines the term 'seaport' and develops the concept of seaports as gateways capable of widening trading areas and patterns. It describes some of the activities in and around them and the widely differing barriers, or social costs, which must be overcome before they can be used. These are the costs of cargo-handling, ships' time, inland vehicle time, storage, finance and of port infrastructure. There is also a description of some current problems in seaports and how they have developed, with industrial relations and general environmental effects being mentioned.

Chapter 4 discusses the reasons why (with some relatively unimportant exceptions) public sector port authorities are needed. It suggests that these are the provisions of property rights for port structures, port planning, "public goods" (like dredged channels and navigation aids) and - perhaps surprisingly to some readers - the application of appropriate competition policies.

Chapter 5 describes the forms or sources of competition for seaports, i.e., between coastlines, countries, individual ports, within ports (e.g., between different terminal operators) and between modes of transport. It discusses possible attitudes to the 'diversion' of cargo through or from the ports of another country, and whether and in what circumstances these should be encouraged or discouraged.

Chapter 6 lists a wide range of activities which are needed in seaports but which may be supplied by the port authority (as in a 'comprehensive' port) or by the private sector. It concludes that the optimum extent of a seaport authority's activities is best decided in the light of a variety of national and local conditions.

Chapter 7 discusses the problem of the maximand to be specified for port authorities and the appropriate constraints. Policies of deliberately maximizing profits, local employment, economic growth, and efficiency are appraised, with some discussion of "public goods" and whether seaports should be subsidized. It concludes that the only tenable maximand is efficiency, but that this has no single definition and that subsidies are generally wrong.

Thus far, the paper is largely in general terms, though drawing examples from Canada as well as from elsewhere. Chapter 8 describes the development of specifically Canadian seaport policies to 1982, from the early days through the findings of the Gibbs Report of 1932, the National Harbours Act 1936 and the growing dissatisfaction with the resulting centralization which led to the 1982 Act.

Chapter 9 describes the Act of 1982 which is already in force. The National Harbours Board (NHB) has been abolished and the Canada Ports Corporation established. Under its provisions, local port corporations with a high degree of autonomy are being established.

This Act, however, provides considerable flexibility as well as welcomes degrees (not always clearly specified) of local autonomy. Chapter 10 thus, deals with the problems of how the Act may be interpreted in light of the needs of Canada as a whole and makes some suggestions.

Chapter 2

INTRODUCTION

This paper was prepared at the invitation of the Canadian Transport Commission (whose copyright it remains) and in connection with a visit I paid to them in August 1983.

They had invited me to prepare a forward-looking paper in the field of maritime economics dealing with a distinctively Canadian topic. I had recently presented lengthy evidence on shipping conferences to the House of Lords Committee on the European Communities (the specialist sub-committee considering the draft EEC regulation on Shipping and Competition Policy) and it seemed to me that proposals for reviving any large-scale international shipping industry for Canada were best dealt with by Canadians.

Yet, Canada is an important overseas trading country, exporting vast quantities of coal, grain, ores and forest products to a wide range of destinations; it follows that the efficiency of Canadian seaports is of great importance. A paper on "Policies for Canadian Seaports" therefore seemed appropriate. It also seemed timely because a growing sense of inadequacy and frustration with the existing statutes had prompted the passage of the Canada Ports Act 1982. This Act is intended to make, and has already made, considerable changes to the extant, or outward and formal, organization of ports in Canada. I wished to concentrate on what was done within the organizational structure thus established.

The object of this paper, then, is not to criticize, complain or to carp about the Act: it is to take it as a foundation upon which to build a structure aimed at securing the maximum efficiency for Canadian seaports for the benefit of those who live in Canada and commensurate with both their desires and the costs of other Canadian activities. We are, in other words, dealing with the ideal distribution of resources. As we see in Chapter 7, however, there are some complexities to be considered in this connection which do not usually appear in discussions of this subject. They stem from seaports being essentially concerned with international trade, besides entailing elements of competition policy not well-known in manufacturing - or service industries and also from what are known to economists as "public goods".

The topic was all the more congenial since, in 1978, I had the pleasure of visiting Canada while conducting research under the terms of a Travelling Fellowship awarded by the Civil Service Department in London. My subject was "The Administration and Management of Seaports", a cumbersome title and one better considered as "Policies for Seaports", since the more interesting parts of my work concerned the relationships between port authorities on the one hand and national, regional and municipal governments on the other. In the course of my research, I visited 15 countries and

interviewed officials of 40 seaports - besides commercial people and officials of other public bodies*. Five of these ports were in Canada, where I also visited various bodies in Ottawa.

In many countries I found close relationships between ports and one particular level of government. This often seemed somewhat to the detriment of relationships with other levels. Thus, in the U.S.A. the federal government has no substantial role in port planning or development - though it has a number of quite expensive programs within ports. In Canada the situation was reversed, with provinces and municipalities having little recognized roles; the responsibility was concentrated with the federal government. In both countries, and for quite different reasons, doubts were expressed as to the wisdom of these arrangements; indeed, it seemed to me that, as major seaports are generally of both national and local importance, it would be better if all levels of government were involved. This view was strengthened by what I had seen of the national planning and support for seaports which took place in Belgium, Japan and the Netherlands, in all of which ports are supposedly a local responsibility, but where no major works or policy changes are likely to be undertaken without approval from, and usually a concensus with national and provincial authorities.

I felt, moreover, that further difficulties ensued from most seaports having no clear idea of their long-term objectives, i.e., of what they were supposed to be maximizing. I learned that legislation was in prospect for Canadian ports and heard some comments on the need for it.

Since the Canadian Transport Commission's invitation was to spend three weeks in Ottawa, there was clearly no time for fieldwork and the paper which follows was necessarily prepared largely in Britain. It might be argued that this was an advantage since it enabled me to concentrate upon the principles concerned and to allow detailed extension - as well as some welcome criticism - to come from Canadians; which is surely appropriate.

> Moreover there is always "Strombom's law":
> "the clarity and ease with which one can describe the solution to ..... transportation problems ..... is directly proportional to the distance between the country and the problem-solver and inversely proportional to the time devoted to applying that solution to the prevailing day-to-day conditions**".

In the event, I received much helpful comment and criticism from Canadians and from colleagues in Britain. Michel Archambault, Sheila Farrell, Ken Glover, Henri Laflamme, and Brian Thomas were particularly

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* The results were published by the Departments of Industry, Trade and Prices and Consumer Protection, as A Comparative Study of Seaport Management and Administration, 2 vols., London, 1979.

** D.A. Strombom, "Transportation in Developing Countries", Traffic Quarterly, January 1966.

helpful at various stages and in Burt Kelso I found an invaluable guide and mentor in all matters Canadian. M. Tessier (and others) of Ports Canada and officials of the Department of Transport were most helpful. Some of their comments have been reflected in amendments (a few of them extensive) to the original paper.

Despite all this help I remain responsible for the views, conclusions, errors and omissions, and it may be well to stress that, when delivering this paper at a seminar in Ottawa-Hull, I felt the occasion to remark that, to the extent that any such material contains anything original, it has more than average probability of being at least partly wrong.

Chapter 3

THE IMPORTANCE OF SEAPORTS*

3.1 Introduction

In a country such as Canada, having an extensive overseas trade, the importance of seaports may seem a superfluous topic and, indeed, the subject is often considered so obvious as to be passed over rapidly. Consequently, the significance and complexity of the subject is not fully understood. It is, however, only from an understanding of why and how seaports are important that proper policies can be derived. It is first necessary to define the subject before discussing its importance and functions.

3.2 What is a Seaport?

A seaport is, primarily, a place where goods and passengers transfer between ship and shore. As such, it commonly occupies a site where there is adequate sheltered water; and this may be largely natural (as with Burrard's Inlet at Vancouver), largely artificial (as with Ashdod, in Israel), much improved by man's efforts (as at Toronto or New Westminster) or it may even be an open roadstead where fine weather is frequent and calm water may generally be relied upon (as at many Mediterranean and Caribbean ports). While such broad classifications can be made, the variations within them are wide so that physically, as well as in terms of location, all ports are unique. Local knowledge is therefore vital. There are other types of ports, whose principal raison d'être lies elsewhere: examples are the terminals of such major canals as Panama, Suez and Welland; and there are also such fuelling ports as Curaçao, Las Palmas (Canary Is.) and St. Vincent (Cape Verde Is.); at many of these cargo is commonly handled as well, though usually only in modest amounts per ship since such places are generally but small producers and consumers of cargo in relation to the number of ships calling.

There are also ports which exist primarily to serve navies, ferries, yachts or as pilot stations. Such places are not within the central scope of this study, though some of the principles developed in later chapters may, mutatis mutandis, be applicable there too.

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* The term seaport is being used to avoid confusion with airports and not to imply the existence of salt water. Thus, Canadian lake ports like Toronto and Thunder Bay are included just as Odessa, on the Black Sea, would be included if the discussion concerned Russian ports.

With these specialized exceptions a seaport should provide, on the one hand, good access to open water and, on the other, access via land transport to a hinterland sufficiently large, in terms of population, production and consumption, for its economic viability. Since (within site limits) many port facilities can be duplicated, viability can exist on a wide variety of scales - though certain modern developments in seaports have greatly raised the minimum cargo throughput needed. Both sea approaches and land transport may need substantial improvements, the one by the deepening and straightening of channels and the provision of navigational aids and the other by the construction of roads, railways and inland waterways. It is rare, in any given country, for all these qualities to exist at many sites. Thus, for example, while there are many fine natural harbours on the coast of Newfoundland, few of them have sufficient population or good access to a hinterland capable of providing much trade; consequently, only a few have been developed. In other words, a demand for seaport facilities is necessary, as well as a suitable site.

This demand may appear even without much population: oil-producing points may have sufficient potential to make their development as ports worthwhile, even though their situations may be extremely difficult, as in the Shetland Is. or the Arctic. Thus, oil and iron-ore exporting ports may record impressive tonnages of both cargoes and ships with only the most limited of populations. Yet again, cargo may be imported to and, after processing, exported from a port on a large scale; this implies some remarkable and immobile resource such as hydroelectricity and this has, in fact, led to very substantial ports being established in Canada, e.g., those near the head of navigation on the Saguenay River, Quebec, or at Kitimat, B.C. Generally, the policy problems raised in such ports are fairly simple, since they are likely to have very few users.

These exceptions apart, the major seaports with which we are concerned are much more complex. In them, many types of cargo move on a large scale in both directions between ship and shore, involving many origins and destinations, both inland and overseas. Ancillary activities, such as the provision of fuel, food, water, ships' stores and of such services as ship-repairing are commonly available within such ports and the economic activities which may be attracted to seaports may often go much wider than those directly needed by ships or cargoes.

3.3 Seaports as Gateways

For any of a wide range of commodities, it may generally be found that the tonne/km cost of transport by sea lies somewhere between 5% and 10% of the equivalent for the relevant land mode - be it rail, road or pipeline.

This is largely because ships can exploit their economies of scale more easily. It follows that seaports do not simply provide the function of a terminal: a place, that is to say, for transferring goods to or from ships in order that a water barrier may be crossed. They also widen the area within which trade may take place by providing for that trade to be carried by a far more economical means of transport. The area, thus, made available to trade widening varies as r^2 when r is determined by the relative costs of sea and land transport. Thus, if r is 10 to 20 times greater when sea

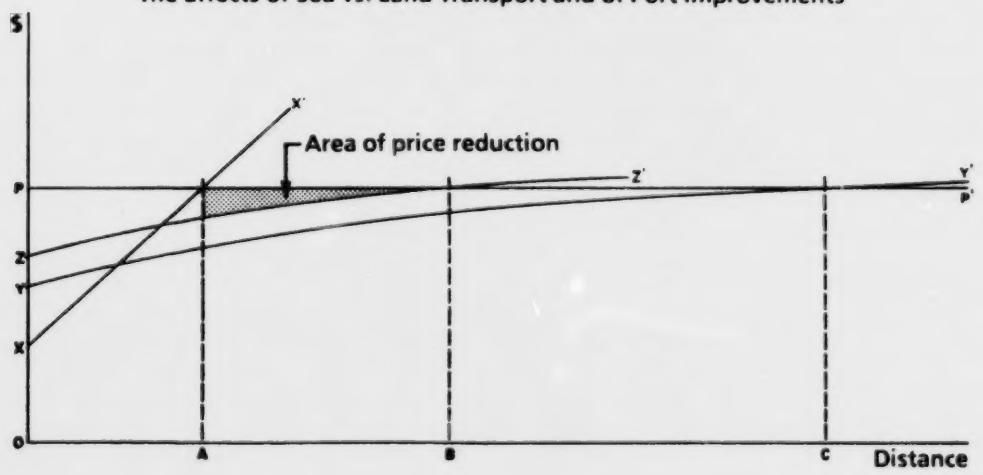
transport is substituted for land then the area of a circle surrounding a seaport will be 100 to 400 times greater. Moreover, because a larger part of sea transport costs are generally associated with the cost and time spent loading and unloading the cargo, (which depends on the efficiency of the port), the incremental cost of mileage by sea transport is generally much less than the 5% to 10% quoted above and the area made economic for trading correspondingly greater. On the other hand, it is likely that much of the greater area thus made accessible will consist of the same land mass, upon which land modes of transport may be more appropriate (since they avoid the costs of handling to and from ships); and still more of the area may be merely ocean.

By separating "terminal" i.e., cargo-handling plus turnround costs from those of the subsequent movement, this may be analyzed further. In the diagram below the PP' represents the maximum price which goods will be traded (e.g., because of competition from other services). There are also three lines showing the relationship between transport cost and distance.

The first, XX' concerns land transport, with OX representing the cost of loading and unloading the vehicle (including the time the vehicle stands still) and the slope of XX' representing the ton-mile cost of moving the goods thereafter. The line is straight because this does not usually vary with distance.

The second, ZZ', concerns sea transport. OZ represents the cost of loading and discharging the ships, including their cost in port (their turnround time). It is generally greater than with land transport. The slope of ZZ' represents the ton-mile cost of moving cargo in ships, which is

Figure 1
The Effects of Sea vs. Land Transport and of Port Improvements



generally much less than with land transport. This slope lessens with distance, so that ZZ' is a shallow curve concave from below, because larger and more economical ships are generally employed on longer routes. The maximum potential trading distance, thus, grows from OA to OB. Within OB, the shaded area shows the extent of a reduction in transport costs from substituting sea for land transport.

The third line, YY' shows the effect of reducing port costs (e.g., cargo-handling, turnround time on both) from OZ to OY. Given the same sea transport costs, the maximum potential trading distance expands from OB to OC and, at lesser distances there are considerable opportunities for lower transport costs.

It is therefore clear that more efficient seaports can have two distinct effects for both imports and exports: first, the lower transport cost may accrue to the producers or consumers of the goods in question (or, as we shall see later, be shared between them); and, secondly, the improvement of a nation's seaports will enlarge its potential trading area, for both imports and exports. It will give opportunities for its people to buy any given imports from a wider range of sources, and thus more competitively, and also to buy a wider range of goods. Similarly, they will be able to export their goods to wider markets and, by doing so, may be able to market goods they had not previously found it economic to produce. Thus, while seaport development will not create demand, it may enable latent and possibly unsuspected demand to be satisfied. It will be argued later in this paper that technological developments in cargo-handling have greatly increased the opportunities for this but that there are significant traps in the development of relevant policies. Careful economic analysis is therefore necessary.

Notwithstanding these economies of scale in cargo-handling, it is also possible to argue that a well-managed public port authority will allow numbers of small to medium-sized firms to engage in international trade e.g., as importers and exporters, or in providing a variety of other port services where previously these activities were in the hands of a few big corporations, often based abroad. Acting independently, many of the businessmen concerned may have been unaware of others wishing to use the port. It is also possible to argue that a public port authority is more likely to be aware of the wider social and economic implications of such potential: though some would respond by pointing to public authorities, in ports and elsewhere, which go to sleep, become ossified through increasingly outdated terms of reference and/or which are corrupt.

3.4 Activities In and Around Seaports

The results of these improvements in a nation's trading opportunities may be seen, not just in the physical appearance of seaports, in the construction and operation of terminals and the bustle inseparable from the life of a busy port: they are also to be seen in the economic activities carried on there. There are two primary, or necessary, activities and many secondary ones.

The first of the primary activities or functions is obvious and visible: it is the handling of cargo. In the past, and especially where break-bulk cargo liners were used, this involved the employment of large numbers of men, often engaged in physically tiring work. As real wages rose with economic growth, so did their cost, for their productivity was traditionally in the region of one tonne per man-hour and modest changes in the capital equipment seem to have made little difference until the basic systems were altered. Modern port facilities employ dramatically different techniques and when used efficiently, are capable of achieving very much higher levels of labour productivity, lower cargo-handling costs and greatly improved ship turnround times.

The second necessary function is that of storage. Trucks, railroad cars and barges are usually constrained as to length, width, height and overall weight by the load gauges imposed, e.g., by bridges, tunnels and locks, and duly reflected in operating rules having the force of law. Such constraints apply much less to ships so that, for example, a modern bulk carrier of moderate size is likely to carry as much as 1 000 trucks. It follows that seaports necessarily provide storage for large volumes of goods, for example, in grain elevators, transit sheds, in container stacks or in tank farms.

These two activities or functions of cargo-handling and storage may be described as the primary or necessary activities. There are, however, several others which may be located at seaports and which may be described as secondary.

Because these stores must be filled and emptied, a port is a good location for combining together similar lots from different sources (e.g., grain from different farms, or in combining LCL* parcels of general cargo so as to fill containers). It is also a good location for breaking bulk, e.g., for re-packing cargoes on arrival for distribution to a variety of local, or inland centres. An example of this is the central distribution centre maintained by Dupont in the port of Antwerp and which, since Dupont do not manufacture in Europe, serves the entire continent.

Where these functions of combining or of breaking down are performed, it is often economic to locate processing or manufacturing activities. Where adequate space is available, there may be direct access for raw materials from ship to factory or vice versa; examples can be seen in port developments in Japan, Belgium and France. It is thus, an important factor in a nation's ports policies that the physical areas covered by their port authorities should be flexible rather than rigid and that neither the statutory terms of reference of those authorities, nor other arrangements (e.g., reserving all employment in a defined area to those on some register), should inhibit such industrial developments from being located immediately alongside the quays from which they can be served.

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* LCL = less-than-container loads.

Sometimes these port-related industrial activities may (deliberately or of necessity) be located away from the port area, as a means of moderating city congestion or opening up new areas to settlement. Thus, where good inland transport is available, physical contiguity is not always essential, though this is not likely to be valid for heavy industry.

Because of the need for land to be made available for port-related developments, it is often useful for the land area to be expanded by reclamation from the sea. As most important ports are located in cities where rebuilding is constantly going on, it is often fairly easy to acquire a good supply of easily compactable hard core for this purpose; and, where it is suitable, dredging spoil may also be used as it has been at Vancouver and New York. Excess water may be squeezed out by 'surcharging' or squeezing it beneath heaps of material. In this way, and over long periods, very substantial changes may take place in seaports' shorelines. Examples exist at Hong Kong, Tacoma, Toronto, Vancouver and Yokohama, while at Kobe and Osaka whole new islands have been created for port purposes by removing hills and providing level building land. Such reclamation projects, whether fed by dredging spoil or from levelling hills may serve two purposes, though they are generally limited by the cost of transporting the material.

The ability of ports to take advantage of such opportunities, provided they are not inhibited by statutory restrictions in exchanging water for land area, (or aquatory for territory) is enhanced by the increasingly land-intensive nature of many modern cargo-handling operations. Moreover, the older parts of seaports are often situated close to the central business district of their associated city. Sometimes these port facilities are obsolete. Even, therefore, if there is no demand for extra space for port operations there, it may be economic to reclaim land with a view to selling it or leasing it out for purposes having no necessary or direct connection with the port. Hong Kong and Toronto are good examples. In Hong Kong, reclamation started almost as soon as the British took possession in 1842. In Toronto, it proceeded according to a plan devised shortly after the Harbour Commission was established in 1911 and maintained (with some adjustments in timing) ever since*. It need hardly be stressed that such operations can be very profitable since they can provide both valuable new land and deeper water. Again, however, transport costs may limit this.

Within a substantial city, there is a need for a multiplicity of commercial or service activities. Banking and insurance are amongst the most obvious. Where, additionally, the city contains a seaport with an international trade this need is much greater. There must be customs officials to regulate the flow of cargo, and consuls to see to the needs of their nationals. A vast number of people are needed in the private sector to buy, to sell and, perhaps most important of all, to ensure that the transactions and the resulting movements of cargo comply with the laws of their own country and of its trading partner and are covered by adequate finance. (It is some exaggeration to say that the weight of a cargo is often

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* Is there any other public body which has maintained the same plan, adjusted only in timing, for over 70 years?

equalled by the weight of paper associated with it.) Great expertise may be built up and may extend to serving other ports and, indeed, other countries. Excellent communications, postal, telephone and telex are essential; a building set aside for such traders, financiers and agents is often useful - e.g., the World Trade Centres in New York and Melbourne.

Seaports, then, will provide the primary functions of cargo-handling and storage; often the secondary functions of assembly and breaking bulk, industry and of land reclamation. A wide variety of associated commercial activities may also develop.

Frequently, they grow from this foundation into great cities: London, New York, Montréal and Vancouver are good examples; and within these, the proportion of economic activities directly associated with the seaport may be quite small. For example, the proportion of the working population employed in the cargo-handling and storage functions of the seaport may be modest, as may the proportion of the city's total road traffic which is going to or from the port.

3.5 Seaports as Barriers

Just as it can be helpful to consider the ways in which seaports induce or inspire economic activities so it is sometimes useful to consider them as barriers or constraints to trade and, therefore, as limiting the activities mentioned above. The costs, or impediments to trade, involved in the primary activities of seaports - cargo-handling and storage - are, by definition, unavoidable - though they can be reduced. The costs of the secondary activities can be avoided, e.g., by locating the activities elsewhere. The costs associated with some barriers are not, however, straightforward; certainly, some of the important ones do not appear in any tariff issued by a port authority or terminal operator, since they appear in quite different forms and, at least initially, are payable by different people. It is, however, useful to bear in mind that they all have to be paid by someone and that, whatever their form and whoever pays (or receives) them, they are all components of what may be termed the generalized* cost of passing cargo through the port.

There is, first, the cost of employing the labour and equipment used in handling the cargo. This may be a simple representation of social in accounting costs or there may be divergencies. Union power may have raised wages or fringe benefits (or both) to levels far above those representing social opportunity costs - and this may happen in developing as well as in developed countries like Canada. They may impose restrictions on output, e.g., by attempting to insist on repacking LCL containers. Institutional arrangements may have been agreed upon and provided for the averaging of

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* 'Generalized cost' is an extremely useful concept in transport economics, where, for example, a road improvement may lead to savings in fuel, journey time, accidents and, possibly, in other forms. The concept, thus, refers to the total of all those components which can be readily estimated and regardless of who pays them.

costs which are not relevant to increments or decrements in output or which represent transfer payments. There may be, for example, decasualization* schemes providing substantial fall-back pay for those dock workers whose services are not needed for any particular day or week; and these may be charged as standard on-costs to wages regardless of the situation prevailing in the labour market at the time. Such schemes may be multiplied for holiday pay, sick leave and a surprising number of other fringe benefits. The aggregate effects may thus be significant. In Sydney, N.S.W., for example, they can easily amount to 116%** of the basic wage, which is itself by no means modest. Similar distortions may occur in charges for the supply of equipment and, finally allegedly competing cargo-handling companies may in fact be members of a price-fixing agreement or cartel. Distortions between price and marginal social cost may also occur in other circumstances, e.g., where a comprehensive port authority uses the absence of competition to maintain inefficiency or excessive profits, where erroneous pricing policies are followed. Claims that profits are only reasonable may thus need to be examined carefully in the light of more than accounting matters.

Cargo-handling often takes place in two stages, for which separate charges are levied. The first, is between ship and shore; this is often (and especially in agreements concluded in North America) between stowage in the ship and a 'place of rest' on the quay, within a transit shed or wherever may be agreed. This is often termed 'stevedoring' and some writers have concentrated their attention upon it to the exclusion of the second stage, which is between the 'place of rest' and the (road or rail but sometimes waterway) vehicle employed for the inland movement. This second stage is often termed 'receiving and delivering' (according to the direction of movement). With conventional (i.e., break-bulk) cargo liners, the first of these movements is often paid for by the ship and the second by the owners of the cargo, though both may be performed by the same people and forklifts, provided by the same employer. The difference lies essentially in the operator of each vehicle being responsible for loading and discharging it***. Where a through transport service is being offered, e.g., by a container operator, the distinction may be irrelevant and only one charge made to the shipper.

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* None of this argument should be read as implying opposition to de-casualization schemes in principle.

** R.O. Gross, "Competition in Cargo-handling: Some Experience from Australia", Maritime Policy and Management, vol. 9, no. 1, 1982.

*** There are numerous and bewildering variations in practices between ports, even in the same country. Many readers will thus know of variations from the simple pattern of practices summarized here. For example, in Fremantle and Tacoma the shoreside work is done by port authority employees; in Toronto they move cargo only between the 'place of rest' and the truck or railroad car.

The second major component of cost lies in the time that it is necessary for a ship to spend in a port in order to complete the handling of the relevant cargo. This time is frequently termed 'turnround time' and quantitatively, it is often as important as the first component. It is often usefully divided into 'gross port time' and 'net port time'. The former is the period between the ship entering and leaving the port (this being conveniently defined as, for example, picking up and dropping a pilot or passing a fairway buoy). The latter is defined as the time for which cargo was being worked in or out of the ship - though it is usual to ignore variations between different parts of the ship (e.g., hatches or tanks) and minor stoppages. It is usual to distinguish the major ship types (tanker, bulker, container ship and conventional liner) and to separate loading from unloading.

The difference between the two periods lies in a variety of components, e.g., queueing while awaiting a berth, cleaning holds, non-availability of cargo or of cargo-handling gear or labour and any periods conventionally not worked, e.g., nights and weekends. In practical port management, it is important to distinguish between these on a consistent and nation-wide pattern*.

The evaluation of turnround times in economic terms is fraught with difficulty and in two ways. First, there are the conceptual difficulties, e.g., of how to measure it and, secondly, there are the practical difficulties of obtaining the relevant data, which do not usually appear even in the internal accounts of shipping companies**. The first may be resolved into a dichotomy between short and long-run marginal opportunity costs. Obviously, for current, e.g., operating purposes, the former is relevant, but even if it were relevant for port planning then it is likely to be unforecastable. The latter may thus be used and will generally reflect the social opportunity cost of capital as assessed for such purposes as investment appraisal.

It should be observed, however, that whatever the methods and sources used, the cost of ships' time in port is, in the first instance,

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* My colleague Brian Thomas, in his work Improving Port Performance: The Management of General Cargo Operations, UNCTAD, Geneva, 1983, defines "Ships Time at Berth", from which "non-operating time" (e.g., meal breaks and periods entirely outside working hours) is deducted to obtain "Berth Working Time", "Idle Time" (e.g., unscheduled delays like breakdowns or shortages of cargo) is then deducted to obtain "Operating Time", which is the time in which cargo is actually being worked at a berth, after deducting all delays. The systematic use of such definitions may one day provide international comparability.

** Further discussion of the topics outlined below may be found in R.O. Goss (ed), Advances in Maritime Economics, UWIST, 1982 pp. 138-177, a reprint of an essay by R.O. Goss and M.C. Mann entitled "The Cost of Ships' Time". This essay also contains some rather out-of-date figures.

reflected in a multitude of costs to the owner of the ship. These include the consumption of fuel for electricity generation etc., the use of ships' stores, crew wages, insurance premia, plus whatever net earnings the ship could have achieved elsewhere in the time available (i.e., the opportunity cost of the ship itself). These net earnings will usually cover, in accounting terms, depreciation and whatever profit can be made*.

With ships on voyage charters, the cost of delaying ships beyond the expected period ("lay days") will be reflected in the "demurrage" rate specified in the charter party and the advantage of reducing its stay in port will be reflected in the "despatch money" similarly specified. Charters are conventionally arranged with demurrage set at twice the level of despatch money**. This reflects the differences in the owners' position in respect of the next voyage; it will often be quite difficult to change delivery dates so that their postponement will often lead to a penalty, while bringing them forward may achieve very little. The contrast will of course, disappear in the long run since there would be appropriate changes to lay days.

With ships on time charter, on the other hand, the cost is passed on by the ship operator to the charterer, usually at a single rate effectively per ship/day***, and this rate will obviously include whatever rate of profit was implied when the rate was agreed. Because charters may cover any period from a few weeks to a ship's life, and because ship charter markets fluctuate, the profitability implied at that time may be quite different from those prevailing during the voyage in question. Generally, one or the other of these arrangements will apply to tankers, bulk carriers, tramps and most specialized ships (e.g., neo-bulkers like wood pulp or car carriers) except when they are owned by those whose cargo they carry. However, even there, the principles of opportunity cost may still be applied and, in the long-run sense, even to the most specialized of ships.

With passenger and cargo liners, including container ships, the operators (sometimes acting in concert with others, e.g., in a shipping conference) generally set their charges so as to attempt to cover their average costs over a range of ports and experiences of port delays: there is no explicit passing-on to their customers of specific delays, though if port

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* We are not, of course, concerned with whether or how the profit may be allocated, e.g., to loan repayment, re-investment or to shareholders' dividends.

** Except, apparently, with entities located in the People's Republic of China, who insist on equality.

*** Though, it is often expressed as a rate per deadweight tonne per calendar or 30-day month.

congestion becomes chronic they may apply 'congestion surcharges' to their basic freight rates*.

In a similar fashion, the costs of any significant deviations from the expected turnaround times for land vehicles are likely to be passed on, especially if they are significant or expected. The costs of individual fortuitous variations may be borne by the transport operator, but he will usually seek to recover them by averaging and adding the result, often terming it a contingency allowance, to his charge. Since he is generally in competition, he may also seek to minimize these costs, e.g., by using articulated trucks, so that only the trailer has to wait while the driver and tractor work elsewhere. It is important that institutional arrangements compensating for waiting times do not inhibit such developments.

The third component of the cost of cargo moving through a seaport concerns the cost of providing storage. These are rare exceptions (e.g., direct ship-railroad handling of containers at Zeebrugge)** but, if only because ships carry cargo in tens of thousands of tons, storage is needed in the sense of providing a buffer stock between one and the other, thus avoiding an excessive delay cost. Physically, this storage may take any appropriate form: a grain elevator, a transit shed or a container stack or yard. In the important legal and institutional sense often employed in North America, it <u>is</u> the 'place of rest'. Specialized or general, covered or not, it is rarely free: though some ports provide it free of charge for a limited period. Depending on the supply of the storage facilities in question in relation to the demand for them, this may lead to a damaging degree of shore-side congestion for the port. One remedy is to reduce the free time and to start charging penal rates thereafter, though this will be of little use if the cause is beyond the cargo owners' control - e.g., if it lies in Customs or in documentation delays. Sometimes, of course, storage facilities may belong to a regular cargo shipper (oil companies' tank farms being one example); whether he then makes an explicit charge is a matter for his own internal accounting system. The point is that there is generally a cost, whether it is identified or not. Because this storage is not one of the port's most obvious functions, its economic significance is often under-

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* Some conference spokesmen complain that these frequently fail to recover the whole of the incremental costs. Some spokesmen for shippers' councils, on the other hand, complain that conferences' congestion surcharges are sometimes maintained after their cause has been cured.

** This is associated with a very large proportion of FCL containers at Zeebrugge. These movements are facilitated by the container gantry operator being able to control directly the movements of flat cars forming up to three container trains. Containers not destined for the train concerned are landed and handled by straddle-carriers. Such arrangements require a high level of organizational reliability and of rolling stock availability. They conflict with the flexibility of a buffer stock, which is generally recognized as preferable.

rated; its calculation as an explicit component of the generalized transport cost is thus all the more important.

A fourth component of the cost of moving cargo through a port is that of finance. At each moment (save in the most unusual circumstances) somebody owns the cargo. The money that they have paid for it, if it was borrowed, has to be paid for, usually with a rate of interest. If it was not borrowed then it could have been lent or invested, presumably at a similar rate of interest. Either way, therefore, there is a cost and it is unlikely to matter much whether this interest is explicit (i.e., paid) or implicit (i.e., not received). Variations in the periods for which cargo 'dwells' or remains in the 'place of rest' - or anywhere else, for that matter - are thus reflected in this financial cost and, again, are payable by the cargo owner.

Finally, in this list of the costs necessarily involved when cargo passes through a port, there is the cost of the capital equipment involved. Conventionally, capital in seaports is divided into 'infrastructure' - channels, breakwaters, locks, docks and quays - and 'superstructure' - the cranes, buildings and mobile equipment which stand upon the former. In engineering terms, this is a very convenient distinction but it will be argued that in economic terms it is not. An important implication of this last point is that public policies which finance these in markedly different ways, e.g., by providing free dredging, or subsidizing all infrastructure, may be mistaken. The economic arguments are not, however, the same for all components of infrastructure and some care is needed in making the appropriate distinctions. This argument is developed in Chapter 7.

3.6 Some Current Problems in Seaports

Since World War II there has been a number of important developments in the technical and economic situation in seaports. These have had significant social and economic effects.

Prime amongst these, certainly as far as Canadian seaborne trade is concerned, has been the massive increase in ship size. Because ship turnround times have not increased proportionately, if at all (and may have fallen in some instances), the results have been twofold; a demand for deeper berths and - perhaps fortunately - a need for fewer of them. Typically, deep-water berths can most easily be obtained by moving to a seaward* site;

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* The exceptions of Southampton in Britain and Halifax, N.S., are worth noting, not only because both ports constructed new facilities upstream or inland from the previous ones but because, wherever a coastline has many indentations like fiords and river valleys drowned by the eustatic rise of sea levels, such opportunities may occur. They are quite distinct from estuarial sites, where downstream development is to be expected. There are many such sites in Canada but it should be noted that, because such geographical features (especially fiords) are usually associated with mountains, they are unlikely to provide level sites for port construction and rarely contain important centres of production or consumption. The unspoiled nature of Vancouver's Indian Arm is an example and contrasts with the bustling port activity on both of the (flatter) shores between the First and Second Narrows.

for a river port, downstream either to natural deep water or to a site involving less dredging as recently announced for Chicoutimi, Quebec*. In some instances there may be a move to offshore locations equipped with mooring buoys. Good examples of this are the oil tanker terminal known as 'Canaport' near Saint John, N.B., and the Louisiana Offshore Oil Port ('LOOP') near New Orleans, La. Nor is this necessarily confined to oil or other naturally liquid cargoes: the Marcona Corporation regularly ships iron-sands from New Zealand by pumping a slurry through an offshore single-point mooring buoy on to one of their ships**. Nor is direct ship-to-ship transfer limited to oil: there are regular transfers of dry cargoes from self-unloading lakers (in whose design Canada's shipbuilding industry has achieved a remarkable advance) in the lower St. Lawrence River (off Sept-Îles) and in the River Plate. An offshore coal handling plant has been proposed for Israel. Floating or artificial islands to carry buffer stocks are often suggested and sometimes built. An important example, which is already being extended and may well be copied elsewhere, is the 22 ha artificial island at Roberts Bank, some 30 km to the south of Vancouver, of which it is a part.

For general cargoes, much has been done with containers and ro-ro services. Often, these have involved either moving to a new site (as with Halterm at Halifax, N.S.) and often with some reclaiming of land: or it has involved extending the waterfront to the ends of the finger piers previously used, as at Saint John, N.B., New York and Sydney, N.S.W. Here too, ship size and cargo-handling speeds are positively correlated, just as economic theory predicts, and deeper water at berths and in port approaches has often been required. Sometimes it has been necessary to straighten channels as well.

The development of container and ro-ro terminals has been accompanied by a marked rise in the cargo throughput per metre of berth length, so that the reduction in aggregate berth length inherent in the enclosure of finger piers has often been acceptable. The flexibility of simple lineal quays in accepting varying ship sizes is a further advantage. It has not, however, been accompanied by any marked change in the cargo

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* Transport Canada press release, April 28, 1983.

** Though apparently a success, neither this nor many other slurry experiments have been widely copied. A factor in this may be the deep and prolonged slump in freight rates and the corresponding low cost of ships' time. If this speculation is correct then an end to the slump might see a revival in such ideas. For an optimistic view written before fuel prices rose and well before the slump in shipping freight rates, see M.J. Fraser and L.P. Connolly: "Marconaflo and Its Use in New Mineral Developments", Canadian Mining and Metallurgical Bulletin, March 1972, pp. 134-14.

throughput per square metre of berth area*. In other words, ro-ro and container berths have come to extend much further back from the water. Given that most of the cargoes are weather-tight (being in containers or vehicles), transit sheds are no longer needed in their previous form or location: though superficially similar container freight stations are needed, they generally need to be sited away from the ship, close to the terminal entrance and equipped for the ready movement of goods between trucks and containers by forklifts. Indeed, there are good arguments for siting them away from the port area altogether, so as to reduce traffic congestion (a few well-loaded trucks instead of many partly-loaded ones) and encourage competition. Trade unions may often seek to limit this. Relocation of port facilities may have the further advantage of enabling direct connections to be provided with arterial inland transport routes, particularly roads, thus by-passing congested city streets.

Both bulk-handling and unitization developments have been accompanied by enormous improvements in labour productivity; indeed, they were partly induced by a need to economize on a resource whose increasing expense was far from being matched by increasing productivity with conventional methods. In fact, in most countries this increase in productivity so greatly exceeded the increase in trade that, with or without a cessation of recruitment, large-scale redundancies were inevitable**. There was a notable success*** in an early agreement - the U.S. Pacific Coast's "Mechanization and Modernization Agreement" of 1960 - by which numerous restrictive practices enshrined in a rule book were given up in return for $25m over 5 years, representing some 4.5% of the annual wage bill, with $10m being used for establishing a guaranteed wage and the remainder for a pension fund. As a result, limitations on sling loads, 'place of rest', multiple handling and manning scales were all removed.

Regrettably, this precedent was not successfully followed everywhere else. In Britain and in the Maritime Provinces of Canada, long and damaging disputes occurred. Both were ultimately settled by removing many long-standing grievances, including the system of essentially casual employment. (In Britain, the same scheme attempts to deal with redundancies as well and this tends to make it grossly uneconomic.)

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* cf F. Suykens, " A Few Observations on Productivity in Seaports", Maritime Policy and Management, vol. 10, no. 1, 1983.

** The only exception known to the author occurred in Singapore, whose trade increased rapidly and consistently over the relevant period. Recruitment by the Port of Singapore Authority was however, highly selective, and extensive retraining was instituted. Short training courses were deliberately used as a means of stabilizing the day-to-day demands for port labour, being easily instituted or postponed.

*** This occasioned much surprise at the time as the leader of the relevant Union, the late Harry Bridges, was a Communist.

In the Maritime Provinces (and in Montréal), the changes involved the institution of a new trade association, the Maritime Employers' Association (MEA), which acts as an employment exchange, allocating labour in line with agreed rules, pays wages and provides fall-back pay for those temporarily without work, and negotiates and performs safety inspections. One of its first contributions to improved industrial relations, when it was founded in 1968, was to insist upon French as the working language. Previously, the employers had tended to use English and the dock workers French. Considering the significance of the Province of Quebec in the trade of the Maritime Provinces, it is remarkable that this had not been done before. Evidently, free competition between stevedoring employers, though existing over a long period of time, had not led to firms with better internal communications, eliminating those whose management continued to use English. This instance of market failure exemplifies the need for public port authorities to monitor and facilitate increased efficiency in whatever ways the local situation may require and regardless of the extent of its own functions. This identification and solution of emerging problems may helpfully be regarded as part of the "planning" function of public port authorities dealt with in Chapter 4.

Drastic improvements have thus taken place in rates of cargo-handling per ship-hour: a modern bulk cargo stacker-reclaimer or ship-loader may handle 5-6 000 tonnes and a pair of container gantry cranes 400 tonnes of general cargo in each hour of uninterrupted operation. Equally drastic changes have taken place in the productivity of waterside labour and in pay, conditions of work and security.

Obviously, all this has involved, at many ports, the movement of people to other forms of work, often with compensation provided partly at public expense. The movement downstream - or, at any rate, elsewhere - of cargo-handling berths has also left large and formerly active areas of the port unused, sometimes decaying into eyesores or worse. It is often difficult to know what to do with such areas and especially if they lie within the legal jurisdiction of a port authority whose statutory terms of reference are limited to port operations carried on with a commercial basis. While efforts can and have been made, and some successes noted (e.g., in Halifax N.S., London, San Francisco and in Gothenberg, Sweden) with tourist-oriented developments, marinas, and museum facilities, these could generally be expanded and repeated elsewhere. Locally-based imagination and enterprise seems, in this, to be every bit as important as money and the exercise of imagination need not be confined to public authorities nor to the private sector, nor to politicians. It should not, for example, be outside the ordinary paradigm of public servants to remove eyesores, nor to plant trees. If such activities should be outside their specified terms of reference then these should be changed. Thus, criticizing the treatment of the southern end of Manhattan, Jane Jacobs says*:

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* J. Jacobs, The Death and Life of American Cities, Random House, 1961, p. 171.

"So much could be done.
The waterfront itself is the first wasted asset capable of drawing people at leisure. Part of the district's waterfront should become a great maritime museum - the permanent anchorage of specimen and curiosity ships, the best collection to be seen and boarded anywhere. This would bring tourists into the district in the afternoon, tourists and people of the city on weekends and holidays, and in summertime it should be a great thing for the evening. Other features of the shoreline should be the embarkation points for pleasure voyages in the harbour and around the island; these ... should be as glamorous and salty as art can make them. If new seafood restaurants and much else would not start up nearby, I will eat my lobster shell."

It may be noted that the municipally-controlled port of San Francisco has followed this advice with a floating museum and that the prediction in the last sentence has been validated: the restaurants of Fisherman's Wharf are world-famous. Vancouver has moved in the right direction with a viewing gallery for the public and organized school parties, at Toronto the CN Tower performs a similar function but in most ports public access generally needs to be easier and informal. Fremantle in Australia and Tacoma, Wash., have shown that this is practicable and leads neither to accidents nor to robbery. In most ports, however, the effort is limited in either area or scope (e.g., to a sanitary and boring park as devoid of interest as of people) or it is absent. All too frequently, both public and private sector bodies object to public access, being unaware of its successful practice elsewhere and equally unaware that the presence of witnesses may tend to hamper thieves.

It is worth remembering that most of the technical developments described in this chapter took most people more or less by surprise. Admittedly with hindsight, it is hard to understand this for the economies of ship size were sufficiently well known to provide standard textbook examples.

Alfred Marshall in his classic work Principles of Economics says*:

"A ship's carrying power varies as the cube of her dimensions, while the resistance offered by the water increases only a little faster than the square of her dimensions; so that a large ship requires less coal in proportion to its tonnage than a small one. It also requires less labour, especially that of navigation: while to passengers it offers greater safety and comfort, more choice of company and better professional attendance. In short, the small ship has no chance of competing with the large ship between ports which large ships can easily

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* Page 290 of the 8th Ed. 1920. The argument, known to economists as the 'cube law' appears to have originated with I.K. Brunel during the construction of his ship, the "Great Britain" at Bristol. See E. Corlett, The Great Iron Ship, Moonraker Press, 1975 at p. 10, quoting a statement of Brunel's made in 1836. Corlett remarks that the 'law' was hotly disputed at the time, e.g., at the British Association meeting held in Bristol that year. See also W.S. Lindsay, History of Merchant Shipping and Ancient Commerce, 1876, vol IV, at pp. 168-9.

enter, and between which traffic is sufficient to enable them to fill up quickly."

Nor were these ideas confined to economists because they sometimes maverick Brunel apart, such ideas were well-known amongst engineers. The distinguished naval architect Sir John Biles' work for the Dominions Royal Commission* is an example. "Time", he said, "is on the side of the big deep-draughted ships" and he went on to express the opinion that: "it will be economically desirable in the future, so far as the ship is concerned, to carry merchandise in vessels with a draught of 60 feet" duly noting the need for sufficiently large markets and the absence of delays*. Following World War II, the conditions of economic growth permitted such entrepreneurs as Ludwig, Naess and Onassis to become extremely rich by exploiting this straightforward set of ideas. The positive relationship between cargo-handling speed and optimal ship size led to ship sizes increasing initially with such rapidly-handled cargoes as oil and ores: only later with the development of unit (modular) stowage for general cargo, were the same principles applied more widely. The general replacement of break-bulk general cargo ships by those of modern design is still proceeding, though for many Canadian deep-sea trades it is complete.

That, despite these well-known and widely accessible writings, so many should have been so surprised may lead to two conclusions: first, it is worthwhile maintaining some continuous research effort whose results are available to those planning seaports; and secondly that flexibility is always an advantage. Unfortunately, with port facilities taking a (often literally) concrete form and having gestation periods greater than ships that is difficult, especially when the more obvious economies stem from increased specialization*.

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* Cd 8460, 1917. See also his path-breaking work: "The Draft and Dimensions of the Most Economical Ship", Trans INA, 1931.

* Biles, cit, 1931. Sir John fully appreciated the principle that larger ships, though able to handle cargo more quickly in terms of tonnes per ship/day, spend more time in port because the increase in cargo-handling speed is less than the increase in cargo to be handled.

* It was, for example, precisely the application of the cube law to inland vessels that made successive Lachine and Welland canals obsolete.

Chapter 4

THE NEED FOR PUBLIC PORT AUTHORITIES

4.1 Introduction

The purpose of this chapter is to examine the justification for having public port authorities distinct from the seaports they control. This necessarily involves discussing their minimum functions for efficiency: it does not involve discussing what other functions (cargo-handling, for example) they should perform; nor the means by which they should be controlled. These last two are discussed later.

Much of this chapter reflects the disappointment that many in Britain and elsewhere have felt when experiencing the results of the extension of public sector institutions and activities; programs of "de-regulation" in the U.S.A. and "privatization" in Britain have been the result, and they have often been buttressed by academic studies of the activities in question.*

It may, first, be helpful to exclude that minority of ports (some of them economically very significant) where no public port authority is needed. This is the simple case where the port has, substantially, only one user. An example would be a port constructed by and for the operators of a single works, e.g., an oil terminal, a mine or an aluminium plant. It is likely that, for reasons explained below, some statutory authority or provision would be needed but where there is only one user then there is very little reason to suppose that the interest of those concerned with the trade through the port will conflict with those of anyone else or with the interests of society at large. Exceptions may be made for safety, pollution and amenity effects, but this is in principle similar to other industries: it is not specifically port-related, though it may involve maritime skills and, therefore, it may be economic for the function to be performed by some competent maritime body, e.g., the Canadian Coast Guard.

This convenient exclusion duly having been made, we may now describe the necessary functions of port authorities. They concern establishing property rights, planning, public goods and the control of competition.

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* In Britain, much of this work has been done by the Institute of Economic Affairs which has not, however, dealt with seaports. The formerly nationalized British Transport Docks Board has been successfully privatized into the new Associated British Ports.

4.2 Port Authorities Provide Property Rights

Generally, on land, property rights, whether derived from written law or accepted customs, are clear. Most land is owned by someone - whether an individual, a business, public body like a municipality or the state. Exceptions may exist for land recognized as being in common ownership but, even there, the nature of common rights and in whom they vest should be clear. Those who possess property rights may exclude others, totally* or for all economic purposes of significance. There may or may not, be an official register of lands and its ownership.

Within what may be termed the aquatory**, there are generally no such rights - though I have been told of some owned by the provincial government of New Brunswick. Consequently, anyone building a jetty or quay is likely to have no legal property rights in it and, particularly, no exclusive rights. Worse, he may be regarded as having erected an obstruction to the free movement of others and liable to legal penalties, e.g., fines or damages. Without the appropriate, and usually exclusive rights there is unlikely to be any such construction. If there is, it is likely to be cheap (so that prospective losses are minimized) and will be correspondingly primitive and temporary.

A curious example of this was the annual re-occupation, in the 16th and 17th centuries, of the harbour of St. John's, Newfoundland, by fishermen. Operated on a strictly "first come, first served" basis and supervised by an elected "admiral" chosen from amongst the early arrivals, the "flakes" upon which they dried their cod were placed as close to the water's edge as possible without disturbing others. It was a rule that all such erections were temporary, indeed, they were systematically destroyed at the end of the season; permanent settlement was strongly discouraged.

In earlier times, extending into the present century, significant amounts of trade were carried in ships so small that, given an appropriate tidal range, they could go aground*** on a beach at high tide and work cargo

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* As in England and Wales. In Scotland and the rural areas of Sweden there is no law of trespass, but, obviously, no one may graze cattle, build, plant or dig on someone else's land. Their rights are therefore limited largely to peaceful passage. Some aboriginal customs included tribal rights of hunting or pasturing but these are not relevant here having generally been derived from circumstances when land was generally not a constraint and particular sites unimportant.

** This convenient term is employed to represent that area relevant to a port which is usually covered by water.

*** An account is given in W.J. Slade, Out of Appledore, Percival Marshall, London, 1972. The practice was, of course, quite dangerous since the weather might change before the tide rose again.

directly into trucks, carts or wagons at low tide. Much skill was required to prevent damage and the necessary hull strength gave the vessels a heavy appearance. Where the tidal range was sufficient, the method was widely used around the Welsh and English coasts well within living memory, e.g., for such cargoes as coal and limestone; and many villages standing on sheltered bays became, without proclamation, authority or investment, regular small-scale seaports. The technique is still, I understand, used in the coastal trade to southern Chile. In these circumstances there is no need for any port authority, save possibly if congestion appeared.

Generally, however, a successful seaport needs berths and terminals that are strong enough to stand up to the use (and occasional misuse) of substantial ships, to usual and unusual weather and to handling large volumes of cargo. Such facilities are unlikely to be provided by anyone unless their property rights are secure.

This can, of course, be achieved in many ways. There may be a statute establishing some kind of public authority - as with the formation of the Port of London Authority in 1909. There may be a public proclamation, as at Port Churchill, Manitoba, in 1927 and at certain Australian ports* and this, too, will have the force of law. There may even be a development very largely by and within private ownership. A remarkable example of this occurred, coincidentally, at Cardiff, where the second Marquis of Bute constructed the first impounded dock** at his own expense in 1839 - though he had to obtain statutory powers to do so. This classic case of entrepreneurship was however, of limited success, for the Marquis died suddenly leaving a one year old son as his heir. Trustees therefore administered the Bute Estate, first for 20 years and subsequently when the third Marquis, on reaching his majority, proved to have little interest in the business***.

The volume of trade rapidly expanded but, financially, the results contrasted with his father's enterprise, for the Trustees, while expanding the dock system, did so slowly or without sufficient regard for the economies

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* See J. Bird, Seaports and Seaport Terminals, Hutchinson, 1971 at pp. 24-25 and the same author's Seaport Gateways of Australia, OUP, 1968 passim.

** Lock entrances were needed because of the large tidal range. The site also involved very substantial reclamation of salt marshes.

*** A remarkable man in many ways, he was extremely rich and wrote learned papers in several languages. He also offended the people of South Wales by becoming a Roman Catholic. See W. Rees, Cardiff: A History of the City, Cardiff 1969 and M.J. Daunton, Coal Metropolis Cardiff, Leicester U. Press 1977, for details of his life and the history of the port.

of ship size so that it was always congested. They truthfully advised that it was not sufficiently profitable*.

The predictable results were, first, chronic quarrelling between the city and the Bute Estate** and, secondly, the development of rival port facilities nearby: at Penarth from 1859 and further away at Barry in 1889. Many of these developments were inspired or managed by Cardiff-based businessmen angered by the Trustees' management of the port of Cardiff. Despite the enterprise of its original founder, therefore, this unusual example of private sector construction, ownership and operation of a multi-user port does not provide a good example. In any case it should be noted, in the context of this section, that the Marquis of Bute had to obtain statutory powers to construct his docks, even though he was a very large landowner in the locality. These powers enabled him to proceed with reclamation and construction works below and above low tide*** as well as above high tide, and to have legal title to the resulting port facilities****. That the investment was, unusually, inspired and financed by one man was due partly to his energy and partly to the lack of any viable local alternative being apparent at the time.

It is of course, possible to argue that statutes creating port authorities provide power and jurisdiction rather than property rights as such. This must be so, since the authority is a creature of statute; the Crown's right (e.g., in Britain of part of the foreshore not already alienated, in Canada of the Dominion or Province as the case may be) can only pass by explicit conveyance. Nevertheless, the power and jurisdiction created by the statute enables the construction of port works with a legal security equivalent to property rights for all practical purposes.

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* Daunton, op cit, ch. 1 gives details. Money rates of return, before depreciation, were about 3% against the projected 8% return. Some of this seems, with hindsight, to have been associated with unimaginative management by the trustees of the Bute Estate who were reluctant to expand what they saw as an enterprise which was financially unsuccessful for the Estate.

** The Bute Estate included much of Cardiff - indeed, much of South Wales - railways and a number of profitable collieries. See J. Davies, Glamorgan and the Bute Estate, Ph.D. thesis, Swansea, 1969 and Cardiff and the Marquesses of Bute, U. of Wales Press, 1981.

*** These distinctions are significant because in Britain most of the foreshore or area between high and low tide is the property of the Crown. The Acts were 1 William IV cap CXXXIII, 1830 and 4 William IV cap XIX, 1833.

**** Ultimately these passed, via the Great Western Railway, to the recently re-named Associated British Ports (formerly the British Transport Docks Board).

4.3 Port Authorities Provide Planning

In even the rudimentary development of ports, there is not only the question of whether anyone has legal title to port works in the aquatory but of what these works should be and where they are to be located. In its simplest form, the problem is analogous to the establishment of building lines on streets - with the flow of ships and water replacing that of traffic. More complex interactions involving siltation and land access are however, involved, as may be access and transit rights for such public utilities as electricity mains and sewers. These exemplify only a few of the reasons why municipal and other public bodies must be associated with port development.

It is, therefore, necessary for some public authority to control a port's physical development; a close analogy would be with town planning and generally going much further than limiting broad types of activities to specific zones. Obviously, the extent to which this is taken in any particular instance depends on the actual rather than the minimum or necessary responsibility of the port authority; but it is obvious that the latter will often include monitoring the hydraulic regime as well as the placing of structures. This will certainly involve nautical surveying, possibly dredging and in complex situations it may include the use of hydraulic models. These are all outside the skills of ordinary municipalities: they are the specialized skills of a port authority.

The essential reason for this is the existence of economic externalities: this is to say, the use that is made of one part of a port affects the use that can be, or is, made of another part. Unless the two have the same ownership and operation then these effects will be outside, or external to, the financial accounts covering that part of the port which is causing the externalities.

There is, therefore, a need for the comprehensive planning (though not for comprehensive operation) of a port. For reasons that should be obvious, this needs to be done in conjunction with neighbouring public bodies, including the city. It may even be done by the city, as at many ports in the U.S.A., though there may then be a problem of including the needs of other public bodies, regional and national so as to serve their wider interests as well. Although the sometimes declining number of operators within a port may seem to make achieving a consensus on a "club" basis, i.e., without a public body, (and possibly including trade union views) this will be on an essentially corporate basis; it will exclude the views of the consumer and of the ordinary citizen for whom the port can provide greater or lesser utilities e.g., by beauty or ugliness. Indeed, it may often be the case that a port authority, by cultivating good relations with the port operators, becomes to a greater or lesser extent their mouthpiece. A well-organized special interest group, with an efficient secretariat and a good public relations machine, can have far more influence than it should.

A remarkable example of the absence of any port planning (indeed of any port authority) occurred at Brisbane, Qld. In Australia, ports are a state rather than a national responsibility but at Brisbane, responsibilities

were divided between the Department of Harbour and Marine, which dredged the Brisbane river, provided training walls and navigation aids but neither specified areas of development nor constructed port facilities. These were wholly the work of the private sector using leases from the Department of Lands or freehold lengths of the river bank, except for a ferry terminal which was operated by the Department of Transport. The result was highly unsatisfactory, with gross over-capacity and a level of port costs double that of the rival port of Sydney N.S.W. Popularly, this was attributed to the dredging, which Sydney avoids: but close investigation revealed that this accounted for only half the difference. In 1970, the Port of Brisbane Authority was established and a program of modernization initiated with a large-scale construction of new facilities near the deltaic mouth of the river following one of the most thorough port planning studies ever undertaken. There can be little doubt that the citizens of Brisbane and of Queensland generally would have benefitted greatly if a proper port authority had been established much earlier.

It is not the purpose of this paper to provide a dissertation on port planning techniques: that has been done elsewhere*.

4.4 Port Authorities Provide Public Goods**

"Public" or "social", goods are regarded as central to the theory of the economics of the public sector*** and are distinguished by certain technical features which render it improbable that they will be provided sufficiently or at all by ordinary market mechanisms, i.e., that there is a market failure. This may be for any of a number of reasons, separately or together.

First it may be impossible to exclude consumers (or beneficiaries) from using it without paying. The classic example of this is the light-

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* See e.g., Bruun and Frankel, Port Engineering, Gulf Publishing, 1981.

**The discussion, being aimed at contributing to the consideration of practical problems, is not concerned with what some writers have termed 'pure public goods'. These are usually defined (see e.g., A.R. Prest and N.A. Barr, Public Finance in Theory and Practice, Weidenfeld & Nicolson, 1979) as having joint or non-rivalrous consumption, non-excludability of patrons who refuse to pay and non-rejectability of consumption. Thus, when all three conditions are satisfied, everyone must consume at the same rate. Defence is the traditional example of such a collective or pure public good, though it might be mentioned this is a value-judgement: to a pacifist it is a public bad. On the contrary, this paper treats as public goods (and services) those which satisfy any of these three characteristics, though in practice only the first two seem relevant to seaports.

*** See e.g., R.A. and P.B. Musgrave, Public Finance in Theory and Practice, McGraw-Hill, 1973, p. 51.

house*. Is it supposed to be that a lighthouse keeper should visit each passing ship in order to collect a fee, and, if so, how would he insist on being paid? If any collection could be made compulsory** then, were it not for the second of these reasons, lighthouses might fall out of the class of public goods and into that of private goods, like cabbages and motor cars, for which ordinary market mechanisms are generally sufficient. Where only a small number of consumers are concerned, then it might be worth their while to bargain together or to form a club or association to which they would pay some form of fee or subscription; but this is likely to work only if the functions are of no great economic significance or if they can exclude non-members from the benefits. Otherwise any free-riders will have better competitive positions. (It may be thought that they would at least be embarrassed: but some people do not embarrass at all easily.)

Secondly, withir the range of levels of use ordinarily expected there may be no relationship between the level of costs in the widest sense of the term and the extent to which the facility is used. Lighthouses are again a good example; so are radio and TV stations and bridges***. In economic terms, we generally say that as the marginal social cost is zero so, too, should be the price. In a seaport context, what applies to lighthouses applies also to lightships, floats, buoys, beacons, radar reflectors and most radio aids to navigation, whether active or passive. (Vessel traffic management systems however, probably fall mainly under the third reason, dealt with below.)

The logic of this is a special, and rather a simple case of the general proposition that, given certain common assumptions, the best distribution of a country's resources of labour, land and capital is likely

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* The economics of lighthouses is an old chestnut in economics, see e.g., J.S. Mill, Principles of Political Economy; H. Sidgwick, The Principles of Political Economy; A.C. Pigou, Economics of Welfare amongst 19th and early 20th century writers and P.A. Samuelson, Economics: an Introductory Analysis 6th ed, 1964 at pp. 151 and 159, all of whom are cited in R.H. Coase, "The Lighthouse in Economics", Journal of Law and Economics, Vol XVII (2), October 1974.

** Practical experience of sending light aircraft to photograph 'rogue' ships (i.e., those not following the prescribed traffic lanes) in Dover Strait has revealed that a surprising number have their names obscured by paint which has flaked off or, in extreme instances, by canvas. Such findings do not augur success for fee-collecting lighthouse keepers.

*** The bridge was first to be identified in this field. See J. Dupuit, "On Tolls and Transport Charges" Annales des Ponts et des Chausees, 1849, translated and reprinted in International Economic Papers, no. 11, 1962. Dupuit, however, favoured price discrimination as a means of raising sufficient revenue to defray the cost.

to be obtained if prices are either equal or at least proportionate* to marginal social costs i.e., including the effects of any relevant externalities. Here, the argument, is that if the increment of consumption costs nothing, then no one should be deterred from consuming it. Since prices generally curtail consumption levels, at least for most people, it follows that the proper price is zero. This will produce zero revenue and hence the need, in principle, for some public provision**.

In practical, terms this second 'public goods' argument applies to far more important port facilities than lighthouses: in particular, it applies to dredged approach channels since, in general, there is no relationship between the total cost of dredging, deepening or maintaining a channel and the number of ships using it. The analogy with a bridge, however unexpected in physical or engineering terms, is close since both involve, in Musgrave's terms***, "non-rival consumption" - at least as long as the channel is not congested****.

It is common for these two factors, of inability to exclude those who do not pay and of zero marginal social cost (or non-rival consumption), to appear together. A lighthouse is again a good example, though a dredged channel is not, since it would be perfectly possible to exclude those who were unwilling to pay for its use. The latter is, therefore, an instance where a specific charge can but should not be applied. The subject is dealt with later in this paper and in the meantime it should be noted only that the case for public provision has been made: not that for a taxpayer's subsidy.

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* The latter allows for certain widespread effects such as sales or value-added taxes and limitations on competition which often prevent prices from being equal to marginal social costs.

** Coase, cit, points out that, in Britain, many lighthouses were originally provided by private owners and were often profitable. The original intentions, however, seem often to have been largely altruistic and the profits accrued, long after, from a growth of trade which had not been foreseen at the time. He adds that, currently, most British lighthouses are maintained by charities like Trinity House and financed by light dues levied, as a hypothecated tax, on ships using British ports. A vital part of all this, however, was the statutory (i.e., public) provision of finance through their dues being compulsory, even though being then paid to private lighthouse owners. Alternatives to public provision include two-part tariffs and various forms of price discrimination. The subject is discussed in Chapter 7, Section 7.6.

*** Musgrave, cit, pp 53-4.

**** For a discussion of congestion in this context, see A.H. Vanags, "Maritime Congestion: An Economic Analysis" in R.O. Goss (ed), Advances in Maritime Economics, CUP 1977 and UWIST 1982.

Thirdly, there may be externalities to some activities in seaports and which need to be controlled. Thus, for example, safety of navigation may need to be encouraged for the benefit of a ship's crew and also for the safety of other port users. The harm done by a wreck may extend far beyond the financial accounts of the owner, to deaths and injuries, to channel-blocking and so forth. Pilotage may need to be made compulsory. So may the use of prescribed routes. A wreck may need to be removed regardless of whether the owner is willing, identifiable, insured or solvent. Fires may need to be put out before they spread to nearby properties. Pollution may need to be prevented or limited. All these are examples where it is not sufficient to suggest that a wise man will always look after his own - and not simply because some people are unwise or improvident.

The externalities relevant to seaports may go much further than these rather traditional items. The provision of public access was mentioned in the previous chapter, as was the relief of city road congestion by relocating port facilities outside their traditional areas. Because a port is often centrally situated, the associated economic activities and traffic may be of major importance in the life of a city and its expansion may well need to be planned carefully and in conjunction with the city authorities. Precisely how and by whom this is done are matters for local arrangement; the general point to be repeated here is the importance of planning (if only in an indicative sense) as a collective or public good and the necessity of this planning involving (as a practical exercise and not merely by exchanges of informative letters between organizations otherwise at arms length) port, city and regional (in Canada, provincial) authorities*. Others, for example, railways, may also need to be involved. If only to prevent professional planners from being carried away by the elegance of their own schemes, the results of their work should be published in forms suitable for public consultation and amendment well before decisions have been taken.

Some public provision is therefore necessary and it is usually** of a form sufficiently specialized to warrant putting it together with other responsibilities, in the hands of a public port authority. What form it should take, how it should be controlled and financed and how far it should go in providing the services mentioned above are matters to be dealt with later.

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* The relocation of the port facilities of Chicoutimi, Quebec, is a good example of this, since it will "make way for a major revitalization of the city's downtown core" - Transport Canada press release April 28, 1983, para. 4.

** Certain services, such as police, fire, pilotage and navigational aids may in fact be provided by other, e.g., municipal bodies; but they are publicly insisted upon nevertheless, and the port authority invariably has some implicit or explicit voice in their provision. It may well contribute to their cost.

4.5 Port Authorities Control Competition

Seaports usually occupy special and valuable sites; the more successful the seaport, the greater is the value of the site. If we consider the whole of any such place as being in sole private ownership then it is obvious that this situation could be used to exploit the consumers in exactly the same way as any other local monopoly. That it would probably be subject to competition from other ports is an insufficient objection, since the monopolist could always set his prices just below the generalized cost of using competing ports*.

The growth of such a monopoly is, moreover, all too likely. If we consider a seaport, well-placed on some natural harbour and serving a nearby city and with all the facilities owned and operated by a number of private firms then it is likely that some of the firms will be more successful than others. The less successful (possibly with owners anxious to retire) will come up for sale. The biggest are likely to come from those already in the business, not so much because they already have relevant experience and knowledge**, but because the resulting limitation of competition will benefit both businesses - and harm the consumers correspondingly. Because the advantages of particular sites may be relevant, this is different from competition policy as applied to manufacturing, or service industries where locational factors are often insignificant. (This is not to suggest that limiting competition is a frequent factor in mergers of port-related businesses: merely that it can be a significant, and anti-social one.)

Were such tendencies to remain unchecked, then we would see a gradual process of mergers, leading to outright monopoly, or to explicit or tacit collusion (e.g., through price-leadership). The results might or might not be noticeable as high profitability; a variety of accounting devices can sometimes be employed to disguise this and, in any case, many a monopolist opts instead for a quiet life, charging prices lower than he could to save the bother of dealing with overt competitors and having costs higher than he need. There is, moreover, a long history of barriers to entry in and around seaports, of which the shortage of suitable sites is merely a geographical cause. Exclusive membership of associations is another.

The contention here is that the developments in port technology described in Chapter 2 have themselves led to sharp reductions in the number of competing firms, that there are many ports at which these numbers are remarkably small and that the policies of port authorities ought to be directed accordingly. For a rare example of these matters being subjected to a full and impartial examination, see two reports of the (now defunct) Prices

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* Their charges plus the costs of the traffic deviating from his port.

** If they did not, they could probably hire it.

Justification Tribunal in Australia*, summarized in a recent paper**. These effects stem from the great increase in the productivity per terminal and the corresponding fall in the number of terminal operators in both bulk and general cargo trades.

It is further contended that the function of port authorities in this field is seriously underrated, possibly to the extent that many experienced port administrators may be surprised at its inclusion in a chapter dealing with the minimum functions of port authorities. Some may even be surprised at it being mentioned.

A possible response, and with which the writer might have some sympathy, is that while the function is indeed important, the port authority is the wrong institution to perform it. It could be argued that they have no knowledge, experience or skills in the field of competition policy - nor are these necessarily easy to hire in the marketplace. More cogently, perhaps, it might be argued that for a port authority to exercise such a function would conflict, seriously and in principle, with their more general duty of promoting the port and the interests of those who work and have their businesses in it. It is indeed difficult for an institution to promote and to regulate activities at the same time.

It is, however, difficult to isolate such arguments from the structure and content of competition policy in a particular country; and equally difficult to generalize. The essential point is that this function should be properly performed.

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* Prices Justification Tribunal, James Patrick & Co. Pty. Ltd. and Patrick Operations Pty. Ltd., Matter nos. N76/3523 and S16/76/39, Inquiry Regarding the Supply of Stevedoring Services at the Ports of Sydney, Newcastle, Port Kembia, Gladstone, Melbourne, Geelong and Portland (Feb. 1977) and Seatainer Terminals Ltd. Matter nos. S16/76/40: Prices Charged for Stevedoring Services, Container Handling and Associated Services .. .. at Container Terminals in Sydney . . Melbourne, Adelaide and Fremantle (March 1979).

** R.O. Goss, "Competition in Cargo Handling; Some Experiences From Australia", Maritime Policy & Management, vol. 9, no. 1, 1982. See also J.A. Zerby, "Competition in Cargo Handling, Some Comments," Maritime Policies and Management, vol. 9, no. 4, 1982.

Chapter 5

COMPETITION AND SEAPORTS*

The competition which seaports commonly experience may come in any or all of five forms.

First, there is competition between port ranges or coastlines, regardless of their nationality. For example, Volos, Rijeka, Trieste, Genoa and Marseilles-Fos in southern Europe are in competition with ports in the Dunkirk-Hamburg range for trade between the Middle East and Asia and the industrial areas of Europe; and ports on the east coast of North America compete with those on the west coast for trades between the mid-west and the same or different overseas areas (e.g., Seattle and Vancouver both compete for car imports with Halifax, Baltimore, New York, and Montréal, whether the cars come from Europe or Japan.)

Secondly, there is competition between ports in different countries. Halifax, N.S., Saint John, N.B., and Montréal compete successfully for container traffic with New York and Baltimore; Seattle successfully competes with Vancouver - with the reasons being quite different. Sometimes this has major effects on national port policies. Thus, it is hard to believe that so much taxpayers' money would have been spent in the development of Antwerp, Ghent and Zeebrugge in Belgium if there had not been so much support for ports in France and the Netherlands.

Thirdly, there is competition between individual ports, e.g., London, Southampton and Felixtowe; or San Francisco and Oakland, California. Often this aspect of competition is assumed to be so obvious as to warrant the closest attention being paid to it, e.g., in terms of financial policy and port development. Sometimes this is a correct analysis; at other times it is inappropriate, being based on an exaggerated idea of the extent to which competition is actually being experienced, or likely to be experienced, from other ports.

It is, for example, fairly common in some countries for ports to obtain each other's tariffs and to make comparisons of the charges shown. The argument behind this is that while the demand between adjacent ports and a correspondingly high elasticity of demand for port services as such, being derived, is likely to be inelastic, a readiness to substitute one port for another means a high cross-elasticity of demand for the services of any given port. It is upon such grounds that ports are often reluctant to raise their charges but keen to enter discussions about the level of charges (as with

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* Parts of this discussion summarize and are derived from J.M. Verhoeff, "Seaport Competition: Some Fundamental and Political Aspects", Journal of Maritime Policy & Management, vol. 8, no. 1, 1981.

U.S.A. Gulf ports) or even into overt cartels (as with the Californian Association of Port Authorities).

Such attitudes may well be exaggerated and for three distinct reasons. First, the relative attractiveness of ports depends on the generalized costs of using them, which includes far more than the charges generally levied on gross tonnages, net tons, deadweight tonnes or ship's length. It includes such other important elements as cargo-handling, turnround time and all the other factors described in Chapter 3, Section 3.5. It includes, in other words, more and quantitatively far more important, matters than the level of port charges. To discuss this last point without taking the other into account is, therefore, to take an unduly myopic view of competition.

Secondly, many important ports are located in cities which are themselves part of a large conurbation. Much of the cargo to be handled has its origin or destination within these areas. The port located close by has, therefore, the advantages of lower land transport costs - plus, probably, those of local partiotism and habit. Admittedly, the incremental cost of vehicle miles (i.e., neglecting terminal costs) is often modest, so that cargo may often be carried long distances; but this is not so in the congested area of a metropolis where speeds are often low. Admittedly, too, there are important ports at which a large proportion at least of containers is carried out long distances; Halifax, N.S., and Saint John, N.B., are well-known examples.

At other places, where much attention has been paid to competing ports and their charges, these effects have sometimes been much exaggerated. The port of New York-New Jersey for example, has always regarded itself as competing with Baltimore (traditionally a railway port and one with excellent inland links) for mid-west traffic. It was not until there was a proper survey of the inland origins and destinations of cargoes passing through New York-New Jersey that it was established that the vast majority of both import and export cargoes were from points relatively close to New York City; which is, after all, one of the world's great centres of population, and with corresponding volumes of consumption and output. It cannot be regarded as surprising that so much should stem from such a big backyard: rather the surprise should be directed at the port managers who got it wrong.

Thirdly, it is unlikely that the two ports will involve identical sea distances: a diversion cost may often be incurred if there is extra steaming time, fuel consumption and so on. Moreover, such is the complexity of real-life voyaging that carrying extra fuel may involve further opportunity costs in the form of carrying less cargo or fuelling at a different port and so on. For all these and the two previous reasons, a comparison of port tariffs may provide only the most inadequate indications of differences in the aggregate cost of using one port rather than another.

The fourth form of competition lies between the various providers of facilities or services within a port. Where, as in Israel, Singapore and many British ports, the port authority provides all services, there is no such competition. Elsewhere, however, the situation may not be so very

different since stevedoring companies, tugowners, pilots and others are perfectly capable of reaching agreements amongst themselves as to the prices they are to charge and the terms on which they do business. It has already been suggested that the sharply increased productivity of modern port facilities is often associated with a reduction in their number and thus with the extent of this intra- as distinct from inter-port competition. This sometimes strengthens, but does not make conclusive, the case for the comprehensive port authority - i.e., that which provides all services within the port area. As noted in Chapter 4, Section 4.5, this tendency imposes a duty upon any port authority which is concerned with overall efficiency of watching this situation carefully and to extents which, in many places, have hitherto been unnecessary. It follows that, while this function is not new, its importance is much enhanced by fairly recent developments.

The fifth and final form of competition relevant to port authorities lies in competition between modes of transport. There are, for example, many instances in Britain where improved rail services (merry-go-round trains with hopper wagons) for the transport of coal to power stations have competed shipping services, and thus certain seaports, out of existence even when there was direct waterside access to the power station. In like manner, air transport has competed with certain trades - notably almost all passengers save those on cruises or ferries - away from sea transport; so seaports have lost out to airports. Cargoes of high specific value or perishability have also tended to go by air and in recent years this has been increased by the widespread availability, often at prices reflecting marginal costs, of the enormous belly-hold capacities of wide-body jet aircraft.

This type of competition often appears - if at all - as a series of specific problems peculiar to a very limited number of seaports. Accordingly, only rather obvious comments can be made on it. First, most of the trades through major Canadian seaports are unlikely to be affected, since they consist of bulk cargoes like grain, coal, ore and wood chips or neo-bulk cargoes like wood pulp and paper and moving to overseas destinations. There is no transport mode capable of reaching these destinations which comes within a long way of competing for such cargoes. Secondly, and given that competition is at the margin, a watch may be kept on measures and practices which militate against the most economic use of competing modes and terminals. For example, it is unnecessary to distort the pattern of trade by imposing a 2% ad valorem charge on cargoes imported through a country's seaports but not through its airports*.

It has already been suggested that it is important that port authorities ought not to be inhibited from environmental improvements or reclamation works by unduly narrow statutes; however wisely these were drawn, circumstances are bound to change and the statutes need to be changed with

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* This is done by the Israel Ports Authority acting on cabinet instructions and regardless of whether the imports enter into exports or are to be consumed in the country. The equivalent rate for exports is 0.2%. See R.O. Goss, A Comparative Study of Seaport Management and Administration, London, 1979, p. 211.

them. Similarly, if regulatory bodies are established, like the U.S.A.'s Inter-State Commerce Commission and Federal Maritime Commission, to exercise control over separate modes of transport, then it is very likely that their statutes will be outmoded by, for example, the development of efficient intermodal transfer systems and the associated through transport documentation. Were such a country to have overlapping hinterlands with an adjacent country devoid of such regulatory institutions, or whose administration of them was more flexible, then it would tend to lose cargo to ports in the latter country, possibly on a large scale. This, indeed, is probably a part of the reason for Montréal gaining from New York and (especially) Baltimore cargo with origins and destinations in the Chicago - Detroit area of the U.S.A.

It may, however, be observed that the opposite movement takes place between Vancouver and Seattle on the west coast. Whatever the problems of intermodal transfer, it seems that the greater range and frequency of container services offered from Seattle outweighs them* in respect of a substantial volume of cargo.

It may be argued that as such volumes of cargo provide employment for men and capital so they should be sought and retained. On the other hand, it might be argued that such volumes of cargo add to the congestion of existing port and transport facilities. Either view might well be put into practice by adjusting the levels of charges for the use of port and other transport facilities and by corresponding levels of investment in them. To the extent that increments of real resources are involved these are important questions.

If, however, there is on the whole, a low usage of existing facilities, the resources employed may have a correspondingly low opportunity cost and it may even be worthwhile discriminating in favour of such cargo movements. This may occur if a grandiose and technically efficient port facility had been provided in error; or if one country's off-peak season dovetailed with another country's peak season: elsewhere it is generally improbable.

The answer is correspondingly clear in the opposite case, when existing facilities are fully used or congested: then, any special measures should be to discourage over-use of the system and to remove marginal traffic.

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* Matters are complicated by the differences in port efficiency, industrial relations, the effects of the "beneficial owner clause" on LCL shipments in British Columbia (see Chapter 8), and the pecularities of railway rates. These have been discussed on a number of occasions, e.g., T.D. Heaver, "The Routing of Canadian Container Traffic Through Vancouver and Seattle", Vancouver, B.C., Westac, 1975 and G. Robertson, "Container Cargo Diversion", Dalhousie, Halifax, 1981.

So much for short-run decisions, i.e., involving the use of existing facilities. What should be the reply if we are asked about incremental investment largely to serve such traffic?

The answer is inherent in that part of the discussion in Chapter 7, section 7.4, which deals with the benefits of investment in seaports accruing to overseas trading partners - i.e., to the suppliers of imports and the consumers of exports. For, where a country has a pure entrêpot trade, handling cargo with origins and destinations outside its own borders, then handling cargo at below the marginal social cost of doing so is pure national loss*. Contrariwise, if any adjacent country can be persuaded to follow such a policy then full advantage may be taken of their error.

Generally, questions of employment levels need not be allowed to complicate such discussions. It may be argued that employment and unemployment are topics to be dealt with in the context of macroeconomics, of which policy on seaports is not a widely recognized part - no more, indeed, than the policy on any other industry. This is true, but the switch from micro to macroeconomic considerations is not always easy (the basic assumptions about feedback, for example, being quite different); and it may be simpler to argue that modern port facilities involve such high levels of labour productivity that they provide very little employment. If the origins and destinations of the cargoes are extra-territorial then so must be any employment they generate; and if (driven into a corner) the protagonist for port expansion praises the incremental employment (and profits?) to be found in banks and insurance we may enquire how that relates to the social opportunity cost of the real resources involved. Given free competition, it is unlikely that any excess over social opportunity cost will be sustained; and if it is, e.g., because there are barriers to entry, then one may enquire in whose interest these are being maintained.

In short, governments may well worry about the barriers to intermodal and entrêpot trade derived from their own regulatory bodies, from the over-building and consequential underusage of their port facilities, from the excesses of protection for labour, capital or manufacturing and from problems of seasonality. They may well wish to use their good offices to solve these problems directly - within the limits of their related institutions and policies: they should generally avoid even the indirect subsidization of people in other countries.

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* It will be appreciated that the statement implies significant criticisms of the ports policies of certain countries, a substantial part of whose cargo throughput has origins and destinations outside their territories.

Chapter 6

THE DIVERSITY OF PORT AUTHORITIES

6.1 Voluntary Functions

Chapter 3 dealt with what seem to be the necessary functions of port authorities. We now turn to those functions which, while they may also be necessary - or at least eminently desirable - may be provided either by the port authority or by other public or private bodies. There is, in fact, an extremely wide diversity of practice in this respect, all the way from the "comprehensive" port authorities of Israel and many African countries, in which scarcely anything is not done by the port authority, to those which are purely landlords*. There are, too, many intermediate positions.

In purely physical terms, a major port must ordinarily have the following:

a) safe access in most weather conditions; this may involve the improvement of entrance channels;

b) safe shelter from all weathers, with adequate depths and space for manoeuvering; it is generally unsatisfactory for ships to have to leave their berths in bad weather, though it may be acceptable for this to be necessary on more occasions, as at Ashdod, or desirable on rare occasions e.g., when typhoons or hurricanes** are forecast, as at Hong Kong;

c) navigational aids, ranging from simple beacons and leading marks to sophisticated electronic aids like Decca chains and vessel traffic management systems;

d) tugs - which may also double as salvage and fire-fighting craft;

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* A good example of the latter is the Fraser River Harbour Commission at New Westminster, B.C., which has a throughput of some 1-1/4mn tonnes a year and a staff of 7. In 1978, the author had the pleasure of shaking hands with all of them.

** There are, of course, the same meteorological events with different names: so are baguios in the Philippines and cordonazos off the west coast of Central America. See J.M. Walker, Tropical Weather Systems, Longman, forthcoming.

e) quays (or piers or jetties) according to the port's configuration against which the ship may lie and upon which cargo may be worked; occasionally mooring buoys or dolphins are used, as at Hong Kong and Bangkok, or an open anchorage as in Singapore Roads - double handling is then involved, on and off the barges provided transit between ship and shore; nowadays a ro-ro ramp is often included;

f) cargo-handling equipment mounted on the quays and suitable for the trades concerned; container cranes are a good example as are reclaimers/shiploaders for ores and coal and elevators for cartons of bananas;

g) repair facilities, preferably including a drydock or floating dock so that underwater damage may be repaired;

h) inland transport connections by rail, road or inland waterway; and

i) a nearby airport so that ships' crew can be changed.

In addition to these physical facilities, it will be necessary to have the following services:

a) pilots to provide expert shipboard advice often amounting, in practice, to shiphandling;

b) emergency services such as those of police, fire and oil pollution removal;

c) sewage, oil slops and garbage removal;

d) fuel supply, by lighter or pipeline to the quays;

e) water supply;

f) ships stores and food;

g) cargo-handling, of whatever variety is needed to serve the cargo in question, backed up by appropriate training and employment conditions;

h) ships agencies, for owners and charterers;

i) banking, so that all the other services can be financed; and

j) telecommunications, so that other people and institutions (ships' owners, charterers, subsequent ports) can give instructions and receive information.

It would be easy to extend such lists to include, say, surveyors to report on the conditions of ships and cargoes, or lawyers to settle disputes or trade union leaders to represent the workers: but there seems little

point in doing so since the object of these lists is to indicate the extremely wide range of activities, skills and institutions involved in the operation of ports. Indeed, it is worth noting that however "comprehensive" a port authority may set out to be, it is very doubtful whether it could provide them all: and even more doubtful whether it should. All these are, however, vital to the operation of a major seaport in the sense that, were any one seriously deficient, the port's whole operations would be significantly affected, probably within a short time.

It follows that if a public port authority is concerned, as this paper argues it should be, with the overall efficiency of its port then it should at least maintain a fatherly eye upon all of them. For example, a local banking failure may be just as upsetting to a port's trade as a fire or a blocked channel. An effective way of achieving this is to maintain formal links via a consultative committee of port users representing a wide variety of interests. It is not a good idea to constrain activities so as to remain within the confines of past practices, nor a narrowly-drawn Act.

6.2 The Optimum Range of a Port Authority's Activity

Which activities out of the list provided above should be performed directly by the port authority and which should be provided by the private sector is a matter on which a remarkable variation of practices can be found across the world. Thus, quays may be privately constructed and owned - subject to the port authority's approval - as at Bangkok; pilots may be publicly provided as at Los Angeles; cargo-handling may be public or private sector - or divided between them as at Toronto or Fremantle. The list of contrasts could be multiplied almost endlessly without reaching any universal conclusion.

Doubtless historic accident plays a great part in all this, but some general principles may be tentatively suggested:

> First: leave well alone. There are always costs involved in disturbing organizations and especially so when the people involved in them see no very good reason for disturbance. In this sense, therefore, 'organizational Lego'* can be very expensive.
>
> Secondly: big organizations are not necessarily more efficient than small ones: they should be established and maintained only for good reasons. These reasons should be examined from time to time as circumstances change.
>
> Thirdly: the performance of an organization is largely a function of how people expect it to perform. If, in any given country, the public sector has a reputation for corruption then

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* 'Lego' is a trade name for a popular system of interlocking building components for children, one of whose features is the facility with which a large number of rearrangements can be made.

> it will attract the potentially corrupt, who will act accordingly; it will be of small public regard. If the private sector has a tradition of collusion and other anti-competitive practices, of ignoring safety and of unreasonably exploiting consumers, workers or both then it will generally be unsatisfactory.

The optimum range of a port authority's activities thus depends far more upon its particular or local circumstances than upon any general principles of seaport administration. It is associated with the law, constitution, customs, history and culture of a country - with the 'feel' of the place. It follows that the people best fitted to make decisions on this subject are those who are that country's citizens. Others may helpfully enquire, study and make suggestions: but, generally, expatriates or visitors will be less able to understand the local situation than people who have been reared in it.

Sometimes this may lead to apparently surprising contrasts: for example, the largely private port of Hong Kong and the largely comprehensive port of Singapore both have British colonial histories (including Japanese occupation) and largely Chinese cultures. Yet both are widely respected as being amongst the most efficient in the world.

Here, as elsewhere, we need to be wary of generalizations - yet some principles* are needed, and it is better if they are explicit rather than left unspoken. It is to these that we now turn.

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* A helpful attempt at elucidating principles in this difficult area has recently been made by E. Bennathan and J. Wishart, "Private and Public Enterprise in the Ports of Developing Countries", Unpublished World Bank paper, 1983. This notes the many ways in which the two sectors can be combined and the rarity as well as the methodological difficulties of studies comparing their efficiencies.

Chapter 7

SOME PRINCIPLES FOR PORT AUTHORITIES

7.1 Introduction

Ports, and also port authorities, are almost necessarily viewed from the standpoint of a profession, whether accountant, engineer, economist, geographer or political scientist. The present writer, being an economist, is no exception. Just as a geographer, say, might start by considering the underlying geology of an area, and its associated coastal geomorphology, before going on to discuss the reasons for the spatial location of any port within it, so an economist will discuss questions of why and to what extent port services are demanded; and of how, by whom and in what conditions they can best be supplied. To some extent, this is what has been done so far, but the point has been reached at which it is necessary to focus the question more finely.

This may be achieved by enquiring what the port, or its authority, is seeking to maximize and subject to what constraints. There are, in fact, very few port authorities in the world which have done this*: indeed many seem never to have examined the subject explicitly or to have formulated a relevant question; and, of those that had done either, a substantial proportion seem to the author to have achieved responses which do not withstand examination. It may therefore be helpful to clear the decks by disposing of some of the objectives which seem to be less appropriate for Canadian public sector port authorities.

7.2 Maximizing Profits

This is rarely, if ever, admitted as constituting a recognized objective, partly because many respondents confuse short-run with long-run profit maximization** and partly because, as each port authority is almost, by definition, a monopolist in respect to its own port, the resulting level of profits might be very high, according to the extent of competition experienced from other ports. (This is, of course, likely to vary according to the commodity pattern in question and how close the other ports are.)

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* Some results of postal questionnaires on the subject were presented by Mr. S. Johnson in his papers "Financial Policies for Ports" and "Port Policy and Port Revenue" presented to conferences of the International Association of Ports and Harbours (IAPH) in 1971 and 1975, respectively.

** This is probably why most businessmen deny it, too - at least those who are willing to respond to questioning by economists.

Nevertheless in a small, densely-populated country like Britain, having a well-developed internal transport network, (so that the hinterlands or areas economically served by different ports may be expected to overlap markedly) a general instruction to maximize profits may not be a bad idea, given that the competition between them is likely to prevent any of them from making unduly large profits for any significant length of time. On the contrary, it is likely to induce financial efficiency.

In a large, sparsely-populated country like Canada, having only a small number of well-developed ports widely separated from one another, implementing such a principle would probably lead to very large profits for some ports and correspondingly, strong public objections. It would be wrong to suggest that these profits would be competed away in the long run by new entrants, because the existing Canadian ports occupy the best sites and, despite what was done elsewhere, could continue to earn locational rent from them. A position of advocating profit maximization as a legitimate objective for port authorities could only be supported if there were large-scale generalized inefficiency and a strong belief in a supply-side response, sufficient for the resulting improvement in technical efficiency to outweigh the loss of allocative efficiency. Moreover, it has already been argued that many activities in and around seaports ought to be provided at zero prices (e.g., navigational aids which might be useful also to passing ships) and that others have externalities. Local pride may be one of these and facilities for the public to enjoy the port by seeing it are another. There seems to be little reason why these should be provided by a private or public monopolist seeking to maximize his profits unless they were built into his constraints - which seems difficult.

7.3 Maximizing Employment

Local job creation is an objective often recognized by ports in the U.S.A. It may, however, be questioned whether it is a valid one and especially if it is applied to employment created within a limited and arbitrarily-defined local area, such as a municipality. This is partly because there will be leaks of purchases of non-labour inputs to the port, and partly because many of the jobs created will be for people living outside the area concerned and, even if they live in it, spending much of their money elsewhere. The effect would be rather like following Keynesian expansion policies in a very small country practising free trade, having a large expatriate population and a high propensity to import - so that the multiplier was probably about one. It is, however, an objective in the pursuit of which it is possible to spend very large sums of money and if other competing seaports implement similar policies then it is not clear where any equilibrium lies.

7.4 Fostering Economic Growth*

A variation on this, and one which recognizes the futility of trying to affect local levels of employment by local public expenditures, is to assert that port developments are necessary for national economic growth. This may be desirable, though the question is rather whether it is worth providing financial assistance (e.g., grants or access to cheap capital) on that account. Proposed questions are often raised, not so much because of the 'public goods' analyzed in Chapter 2 but because of what is perceived as a 'need' for large capital expenditures on modern port developments.

Proposed expenditures are sometimes supported by studies aimed at assessing the 'economic impact' of a port, usually upon some specific area. These studies are, however, of but limited use for such purposes. While it may be both practicable and useful to identify the total and structure of economic activities, employment, wages, salaries, profits and rents directly derived from the port (i.e., in providing most of the services mentioned in Chapter 6) it is well-nigh impossible to identify, let alone to measure, those activities, like importing and exporting firms, which depend indirectly upon the port, nor the extent to which they do so. Attempts to do these generally involve quite arbitrary selections of boundaries, either in the geographical sense or the economic one, e.g., by allocating all of a firm's activities to its main one: in a world with numerous conglomerate firms this is always dangerous and where these maintain profit centres, it is necessary.

These studies are, moreover, not related to any real-life investment decisions in prospect. There is no point in discovering what the effect of closing an entire port may be when there is no possibility of doing so; nor of removing it when that is physically impossible. Any relationships derived are unlikely to be useful in investment appraisals since they represent averages instead of being incremental; they will also be related to a mix of past vintages of technologies (e.g., in respect of labour productivities) and derived from the port as a whole instead of from the relevant parts of it.

There is also a danger of confusing costs with benefits. For example, the 1972 Economic Impact Study of the Port of Montréal shows the direct economic impact of the break-bulk general cargo as being almost nine times that of dry bulk cargo, a ratio which must be largely accounted for by the economy and ease of handling grain - the principal dry bulk commodity. It is however, not a very useful ratio of costs since it seems that rent,

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* Valuable discussions of the importance of ports in this context, with practical examples are given in B.S. Hoyle and D.A. Pinder, Cityport Industrialisation and Regional Development, Pergamon 1981 and an early work in the field is D. Shoup, Port Operations and Economic Development, PhD Thesis, Harvard, 1966. Both works easily demonstrate that incremental expenditures on ports lead to increments in economic activity and that they are enhanced by multiplier effects: they do not demonstrate that the overall results are greater than with expenditures on other projects nor that subsidized ports are necessary.

interest and profits were omitted from both calculations - though they included (as averages) such non-cargo handling costs as harbour dues, fees to customs brokers and pilotage. With some extension, therefore, such studies may be very useful indications of the total cost of moving cargo through the port in question and, in conjunction with comparable data for other ports and periods, provide bases for useful comparisons. This is not to say that carefully-devised input-output tables may not be of use even though they are necessarily based on average relationships and derived from the past. They may help to identify what other public facilities may need to be expanded (roads, for instance) or they may assist private sector firms in their planning. An essential part of this is the construction and publication of adequate statistical series - whether by port authorities or someone else. The systematic identification of forward and backward linkages may also be of value, as may thorough origin and destination surveys carried out every five to ten years.

More seriously, it has been argued that ports may provide for the generation of local industry by providing a better port than some other one or a better port than before. In regions which have suffered long-term structural declines relative to others in the same country* there may well be a case for the special assistance of port facilities needed for the establishment or expansion of other economic activities: but never on their own and only as a part of a carefully-constructed regional policy. In other words it is a regional problem: not a ports one.

Elsewhere, it may be argued (subject to the public goods arguments stated in Chapter 4) that there is no obvious reason why the industry benefiting from the improved port facilities should not pay for them in exactly the same way that it will pay for its other needs. This is seen most clearly in the investments made in container terminals in Halifax, N.S. and Saint John, N.B., where most of the containers go to, or from trains destined for inland Canada or the U.S.A. For the most part, therefore, such traffic cannot create any employment in Nova Scotia or New Brunswick - its origins and destinations being elsewhere. And, to the extent that a minority of containers do stay in those provinces, there is no reason to believe they do not create benefits (or cost-savings) for which the recipients can reasonably be expected to pay. Finally, it should not be argued that modern port activities like cargo-handling and storage are themselves likely to create much employment. Being capital-intensive, they do not.

The distinguished Netherlands econometrician Professor L.H. Klaasen has provided a formal analysis** of the argument that port facilities should be subsidized (provided free or with cheap finance); the relevant section is annexed to this chapter and the conclusion is worth repeating here:

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* Newfoundland, say, or South Wales.

** L.H. Klaasen, "Macro-economic Evaluation of Port Investments" in the Future of the European Ports, De Tempel, Bruges, 1970.

"the optimal degree of subsidization of a port is zero".

One might go further than this and in five ways. First, and simply by way of amplification, we may stress that to the extent that ports or industrial activities associated with them belong to high growth sectors* or provide sustained high levels of either profits or wages then they can well afford to pay for the port facilities they need: and if high rates of return are actually sustained over long periods then perhaps the relevant competition authorities should examine whether there are undesirable barriers to entry.

This argument is merely a special case of the 'Morton's Fork'** argument: if the proposal pays then it does not need public support: if it does not pay then it ought not to get public support" - against which the Rochdale Committee on Ports*** issued a careful but unspecific warning.

Secondly, we may examine the argument to see whether its assumptions are realistic. We may note that towards the end of the text reproduced in the annex to this chapter, it is assumed that:

"the rates" (i.e., prices) "charged equal the marginal costs".

It may be argued that, in Canadian as in other nations' seaports, the prices charged frequently do not equal marginal social costs and that this is highly relevant to investment appraisals and especially to those expressed in purely financial terms. In formal terms, one may say that the social optimality of a discounted cash flow calculation depends upon the social optimality of the prices of all the inputs and the outputs and, for that matter, upon the social optimality of the prices of competing inputs and outputs, insofar as there is any elasticity of substitution; and that this condition is frequently - indeed, commonly - unsatisfied. An important subject is thus identified for examination: it may be argued, however, that the proper response is to reform the pricing structure rather than to subsidize seaports.

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* F. Suykens, "Enkele beschouwingen betreffende de industriele functie van de haven van Antwerp" Economisch en Sociaal Tijdschrift, no. 3, 1966.

** John Morton (1420-1500) adviser to King Henry VII, Archbishop of Canterbury 1486, Lord Chancellor 1487 and Cardinal 1493; traditionally the origin of a sophistical dilemma in tax-collecting: he assessed high taxes upon those who lived in style, arguing that they could well afford it, and also upon those who lived meanly, arguing that they must have significant savings. Sir Thomas More, who knew him well, makes him appear in his Utopia without referring to the dilemma.

*** Report of the Committee of Inquiry into the Major Ports of Great Britain (Rochdale Report) 1962, Cmnd 1824, para. 227.

Thirdly, we may note that this approach implicitly assumes an absence of interactions between ports. This might be realistic if their hinterlands were separate or if developmental increments to port facilities were usually small. It has been stressed earlier in this paper that neither of these are valid. While this raises problems*, it does not necessarily invalidate Professor Klaasen's dramatically simple conclusion.

Fourthly, we may note that his argument ignores the 'public goods' elements discussed in Chapter 4. However, we may also note that it does not necessarily follow from the existence of public goods in seaports that taxpayers' finance or subsidy is justified for public port authorities. For, given that the same authority controls several port activities (dredged approach channels, say, and operating or acting as landlord for bulk cargo or container terminals), there is nothing to prevent funds derived from the latter being used to provide for the former. This would have the advantage in that it is the community benefitting directly from the investment which would be paying for it.

It is sometimes suggested** that there may be economies of scale in seaports. Usually, the argument is derived from queueing analyses and it is indeed demonstrable that, given random arrivals, homogeneous ships and berths, there will be a smaller burden of waiting time in a port with more berths and a proportionate increase in cargo volume. But arrivals are often not random since ships are operated by managers who can and do react to queue lengths; nor are berths and ships homogeneous. Apart from berths differing in productivity and nature, they are site-specific. Generally, as more potential berth-sites are used, so more investment is needed to create those of the quality needed. Thus, long-run diminishing not increasing-returns to scale may be assumed at many, if not most ports. It thus becomes unnecessary to consider the standard range of techniques for dealing with cases where substantial economies of scale persist up to the level demanded (i.e., subsidy, price-discrimination and two-part tariffs).

The fifth extension to professor Klaasen's argument, though apparently obvious when it is pointed out, is often missed. Seaports generally serve international trade and it would be strange if all parties to the transactions concerning the passage of cargo through them did not benefit. (If they did not benefit, why should they engage in those transactions?) Similarly, it is to be expected that they will benefit, to varying degrees, from any port improvements. So far, so good, but these beneficiaries include the producers of imports and the consumers of exports: and both of these groups are residents of other countries.

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* It is the serious possibility - and in Canada the probability - of interactions between ports that prevents the simple use of purely financial investment appraisal techniques from being optimal, even if the pricing structure did reflect marginal social costs.

** E.g., E. Bennathan and A.A. Walters, Port Pricing and Investment Policy for Developing Countries, World Bank, 1979, Ch. 3.

In general, this is a natural result of international trade and need cause no concern whatever. An exception appears, however, when some of the benefits stem from subsidies to seaports and accrue partly to foreigners. (There is, surely, nothing xenophobic in suggesting that public expenditure should be controlled so as to prevent its benefits from leaking abroad. We are not discussing foreign aid.) The formal treatment of the problem is, unfortunately, beset with difficulties both theoretical and practical.

The first problem lies in identifying the beneficiaries. If we considered such improvements to a port's performance as improved turnround time and cheaper cargo-handling, it is fairly clear that the immediate or primary beneficiaries are those who are concerned with operating the ships. Considering, first, a bulk carrier on time-charter, the benefits will accrue directly to the charterer (not to the shipowner) as a shorter time-charter and lower stevedoring costs. There is no reason why the charter should be of the same nationality as the shipowner, so the flag of the ship is quite irrelevant, even supposing that the beneficial owners of ships always registered ships in their own countries - which they do not. It is, in other words, wrong to allocate any such benefits according to whether the flag is national or foreign.

Considering next a ship on an ordinary voyage charter, it is likely that the faster turnround time will be reflected in less demurrage, more despatch money (neglecting the customary difference between these) or in a lower charter rate and that the lower stevedoring costs, payable directly by the ship, will (since they must be predictably lower) be reflected in a lower rate for the charter since the charter will have been arranged in a competitive market. Again, therefore, the benefits pass quickly to the charterer whose nationality, again, has no necessary connection with that of the ship.

It would be tedious to repeat such arguments for all the variations of chartering that exist; it will be sufficient to suggest that, given the competitive markets which exist in shipping, all such benefits will be passed on to charterers. In general, this is likely to be true also of cartelized services like shipping conferences, though their practices of averaging freight rates over whole ranges of ports may give rise to some difficulties.*

In estimating the benefits of a seaport improvement, it is often helpful to identify these primary beneficiaries, since this is the level at which the effects may be most clearly seen. But it would be misleading to imply that this was their ultimate destination, for charterers (grain brokers, for example) may themselves be assumed to operate in competitive

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* This practice seems first to have been attacked by S.G. Sturmey in his paper "Economics and Liner Services", Journal of Transport Economics and Policy, May 1967, reprinted in his book Shipping Economics, Macmillan, 1975. Similar criticisms have appeared in various publications emanating from the Shipping Division of UNCTAD. I have been unable to trace any substantial reply from the conferences, their members or from any representative body.

markets. Thus, the benefits they obtain will, by a similar process of competition, be passed on to those with whom they deal. Given the lengthy period of gestation and subsequent use for most port investments, there is ample time for such improvements to become known and for their effects to be spread.

No matter how many times these goods are bought and sold, no matter what physical transformations may take place, if we assume competitive markets throughout, then these benefits will be ultimately passed back to the original producer and on the final consumer. There is, indeed, nowhere else for them to go*.

It is tempting to pursue this by attempting to calculate shares**. It is, after all, an apparently important matter whether benefits accrue to one's own citizens or to foreigners. But this paper is concerned with ports, and with the development of policies capable of practical application to seaports, i.e., with the use of theory rather than with its development. Can we say anything useful?

Because of the lengthy periods of time involved in major port investments we can be quite sure that, if we attempted to identify the international division of benefits we would need to obtain the long-run elasticities of supply and demand for each of the various commodities concerned and with each of the various trading partners. We may also be sure that these long-run elasticities would be higher than those of the short run, simply because the former are free of the constraints of industrial structure and capital equipment which, by definition, apply in the short run. Probably, they would be a good deal higher.

Yet there is no technique by which long-run and short-run elasticities can be distinguished. Those price-elasticities of demand derived, usually along with income elasticities, from multiple regression analyses are a mixture of the two. Moreover, to apply them to future situations involves using functional relationships derived from the past which is only one stage better than extrapolating past trends. For such purposes as short- and medium-term forecasting this is often useful, even though the relationships may need to be judgementally modified: it is not necessary here and would certainly produce misleading results if we tried.

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* Divergencies from competitive markets and such governmental effects as taxation are questions of fact which may well vary from case to case. Generally, however, neither are the concern of port authorities and it will be shown that they do not affect the question of subsidies.

** For an example, see A. Ray, "The Optimum Depth of Water in a Port", unpublished World Bank Economics Department working paper 67, 1970. This paper assumes not only that deepening costs and benefits are known, but that the difficulties discussed below can be overcome.

The obvious alternative is to follow the pattern implicitly adopted by most countries in respect of most of their import and export business: to try to ensure that it is carried on at a reasonable profit. In the practical context of seaports this means that (public goods apart), we invest so as to ensure that we at least recover the social opportunity cost of capital. This is most easily done by applying financial criteria to port investments, using socially optimal prices for the inputs and the outputs but allowing for interactions between ports.

A good system of national and regional port planning will thus have four components: it will ensure that proper and appropriate systems of investment apparaisal are used; it will ensure that they are based on marginal social costs; it will ensure interactions between ports are duly explored and taken into account; and it will ensure that environmental and other external effects are also taken into account. It may also be helpful, and especially in a mixed economy of public and private sector operations, if a systematic watch is kept for instances of market failure. Because the Department of Public Works dredges Canadian ports and their approaches free of charge, it should be stressed that the foregoing applies to their work. (See Section 7.6, on the special care of dredging.)

7.5 Subsidies and Seaports

Considering the arguments presented thus far we may note that, far from contradicting Professor Klaasen's dictum by examining points he did not explicitly cover, we have tended to support it - though still with the possible exception of public goods. Indeed, we may now say that whereas Professor Klaasen's argument was concerned solely with the optimal distribution of resources within a country, his conclusion is strongly reinforced by extending the argument to cover their international distribution.

This is sufficiently important, besides being at variance with the beliefs and practices of many countries, to be stated formally:

> In general, there are two reasons why seaports should not be subsidized. The first is that it employs an economy's resources where their marginal social productivity is lower instead of where it is higher; and the second is that an unknown part of the benefits will go to other residents of other economies.

What is true for countries is likely to be even more true also for local subsidies e.g., those emanating from the tax payers of regions and cities; since some of the benefit for which they have paid will go to residents of other parts of the same country. It has often been argued* that port activities and expenditures are subject to regional and national multipliers. So they are, but so too are all other expenditures. If then,

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* E.g., Professor Eric Schenker, The Port of Milwaukee, U. of Wisconsin Press, 1967.

there is a local reason for public expenditure, it does not apply especially to ports save with externalities and instances of market failure.

This argument is, moreover, sufficiently important to warrant careful definition of the term 'subsidy' which, so far, has been used loosely. In official circles, it may be used to refer only to grants of money given for capital or current purposes: here it refers to any form of financial assistance which has the effect of providing seaports with resources at less than their social opportunity cost. This, their value in the best alternative use, may frequently be their money cost as it appears in a free market. Sometimes, as when mass unemployment exists - so that working in a seaport is in practice, the only alternative to not working at all - it may be much less and even zero. Sometimes, as with the movement of traffic on congested city streets, the social cost of the marginal vehicle may be far more than the private or money cost to its owner - because of the incremental congestion it causes to other vehicles*. But these examples are not generally very relevant to seaports, the one because modern port facilities are capital-, not labour-intensive and the other because maritime congestion is generally regarded as sufficiently dangerous to be regulated in quite other ways - by compulsory pilotage and traffic management systems, for example. Anyway, since subsidies are likely to increase the level of activity, they are likely to increase congestion, both on land and on water. If this is really a problem and if the proper solution is economic then it is taxation, not subsidy, that is needed.

Subsidies and other forms of financial assistance are, moreover, only a special case of deviation from the optimal pricing of the factors of production employed in ports. As we shall shortly show, deviations can equally exist in the opposite direction and can be equally damaging. It is, therefore, convenient to treat subsidies as if they can be both positive and negative.

Within this definition of social opportunity costs of resources, however, come certain difficult problems. It is, for example, quite possible that trade unions which operate a closed shop and then restrict entry may so raise the level of their members' earnings as to extract a part of a seaport's locational rent. Indeed, wherever entry to some relevant body is restricted - employers' associations providing access to skilled port labour through a decasualisation scheme is another possible example, and one which may be arranged in tacit collusion with unions - there is a danger that the social value, or economic rent, of the seaport's location is being quietly siphoned-off. The test for this is whether the rewards to the factors of production in question are excessive by comparison with what they could

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* This important element of the theory of congestion was first described by A.A. (now Sir Alan) Walters in "Track Costs and Motor Taxation", Journal of Industrial Economics, vol. II, no. 3, April 1954. For a recent statement, see A.A. Walters, The Economics of Road User Charges, World Bank Staff Paper 5, 1968. For a re-statement in a maritime context see A. Vanags, "Maritime Congestion and Economic Analysis" in R.O. Goss (ed), Advances in Maritime Economics, CUP 1977 and UWIST 1982.

obtain elsewhere. As the Reports of the Australian Prices Justification Tribunal* have shown, there is often room for competition to be limited, prices to be agreed, (or price-leaders to be followed) and for profits to be both excessive and disguised by ingenious accountants. It was suggested in Chapter 4, section 4.5 that preventing this is one of the necessary functions for a port authority. It is necessary in the sense that it is needed for the efficient and economic operation of the port; like any other function it can, of course, be neglected or performed inadequately.

While labour and private capital may sometimes be supplied at excessive cost, capital suplied by or through the public sector is often suplied on terms below its social opportunity cost. Thus, provision of capital as a bank loan to a Canadian Harbour Commission may reflect the bank's view that the federal government is effectively a guarantor. Accordingly, the rate of interest may be lower than if it reflected the riskiness of the Harbour Commission's operations, let alone the riskiness of the particular project for which the money is being borrowed. It does not follow from this that ports should not be allowed to borrow on such terms: rather, it follows that they ought to be encouraged to ensure that their investment appraisal techniques use the social opportunity cost of capital, and not the rates of interest they will be paying. This will probably be a good deal higher, as has been demonstrated recently during the recent period of high inflation rates when real interest rates were often negative.

In other words, insofar as a port authority is responsible for major investments, it should attempt to recover the social opportunity cost of capital and not to pass on to its customers any advantages it may have as a borrower. The resulting differences will, of course, appear in its profit and loss accounts, to be dealt with in the usual way.

In these accounts, the cost of capital has two elements: the return of capital and the return on capital. The former is usually labelled "depreciation" and the latter "profit before interest and taxes", being essentially a surplus.

Generally, the depreciation follows some convention which allows the total cost of an asset to be written off, or depreciated, over its estimated economic (not physical - the distinction is important with robust and therefore long-lived seaport structures) life. Where there is any general change in the level of prices, this must be adjusted accordingly and in practical terms this means that depreciation should be charged at replacement cost. This may of course, involve compiling appropriate price indexes or obtaining them from elsewhere. It should be noted that it is not relevant to object that an asset would probably not be replaced with anything similar since charging depreciation on a historic cost basis never involved any such assumption and the adjustment to replacement cost is merely an allowance for changing prices. Replacement capital values should also be shown in the balance sheet so that rates of return, i.e., the surplus or

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* Cit, Chapter 4. It should be noted that neither of the firms investigated made any public reply to the Tribunal's adverse conclusions.

return on capital, may be properly adjusted as well. It should be noted that, if these simple operations are not carried out, the true profitability of the port may be very seriously exaggerated. If, at the same time, the port has a financial doctrine of making only a modest profit then it will be gradually giving its capital away to its customers, many of whom are foreign.

It may also be desirable to make certain adjustments to monetary items, e.g., on working capital in order to adjust fully for the effects of inflation, some authorities believe in extending this to long-term capital. (There is currently some disputation within the accountancy profession.)

7.6 "Public Goods" in Ports

These findings may equally be applied to the "public goods" discussed in Chapter 4, Section 4.4. The difference lies in the specificity of the pricing, for it was argued there that, in many circumstances, the socially optimal price is zero. This may seem inconsistent and an example may help.

Suppose we are considering creating a new port, to consist of a dredged approach channel, with suitable navigation aids, leading to a number of berths. For simplicity, let us assume that the port authority to be established will act as a landlord leasing out the berths to a number of private sector firms which will compete for the opportunity and, subsequently, for the trade through the port. The berths will be of no use without the channel and navigation aids and the problem is whether to undertake this large-scale work.

On the arguments presented above (and leaving environmental, visual and regional policy effects out of account) the answer should not be determined by whether each of the berths is estimated to be profitable, nor whether the channel will be profitable - since, given the socially optimal zero price level, it clearly will not. Instead, the answer is given by whether the investment produces a satisfactory return (i.e., covering the opportunity cost of capital) in total - berths, channel, port authority offices and all. If there are possible variations in the scheme, e.g., in the number of berths or in the dredged depths then these represent mutually exclusive investment proposals and may be dealt with by the standard techniques available. It is quite unnecessary to devise complex two-part tariff schemes to recover the cost of the dredged channel* since the necessary revenues will appear as a general surplus derived from the rents of the berths and the capital invested in the port as a whole.

Were the problem to be the more familiar one of deepening an existing approach channel then, given sufficient forethought on the terms

* As, e.g., in A.A. Walters: "Marginal Cost Pricing in Ports", Logistics and Transportation Review, vol. 11, no. 4, 1975.

which leases were let, it should prove possible to recover the dredging costs from increased rents from the lessees. If the increase in the rental value of their property is not sufficient to cover the costs of deepening then this is good evidence that the deepening proposal is not worth-while. No problem of allocation should arise since competitive bids for the berths gaining most from the deepened channel will be greatest. It should, however, be noted that quite a different problem arises where the channel to or through one port also serves another. Such a situation exists on the St. Lawrence from Québec to Montréal and would be repeated if the question of deepening the St. Lawrence seaway were ever considered.

Apart from this last, then, a landlord port (a form which applies to most major ports in Canada) has a simple and convenient test for project evaluations of this nature. The rule is to ensure that the proposal produces sufficient revenue to pay the social opportunity costs of the resources it is proposed to use. The necessary costs should not be extracted from the taxpayers, nationally or locally, since many of them will not benefit from the port improvement, either directly or indirectly. It should be extracted as charges from those who are likely to receive the strongest and most immediate benefits, i.e., these have been diffused through the economy.

Benefits, over and above these, will still accrue and will be passed on, some to residents of the country in which the port is situated, some to foreigners. This last need be no cause for concern since exactly the same effect is produced in principle by any international trading.

7.7 Maximizing Efficiency

If it is inappropriate for accounting profits, employment or local economic growth to be consciously maximized and for ports to be subsidized nationally, what can be the answer? Earlier chapters have described the wide variety of functions commonly provided by seaports; in this may lie both the solution and a number of difficulties.

In Chapter 3 it was argued that, while ports act as gateways, they also place barriers to the free and rapid movement of goods and of the ships and land vehicles providing transport. Though many of these barriers appear initially as physical constraints (e.g., ship turnround time, or container dwell time), they are at least conceptually capable of being transformed into economic ones. Others, such as cargo-handling costs, appear initially in financial form*. It is, however, both difficult and unrealistic to expect all of them to be expressed in like terms. It is difficult, e.g., in the valuation of ship turnround time, because the values to be ascribed to the physical effects, though conceptually clear and easy to calculate, may be impossible to obtain in practice. It is unrealistic because some of them are

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* This is of course, a simplification, for they initially appear as man-hours and so on, to which rates of pay etc., are attached before they are added up: but the composition of these costs inherently comprises so many different items that it is difficult to disentangle them.

largely psychic in nature, being quite unrelated either to observable market values or to generally acceptable 'shadow' prices as to be capable of expression only in physical terms. Examples of this would be the accident rate for port workers, environmental and visual effects*. Can we, then, do nothing worthwhile?

This problem lies partly in the difficulties of measurement and partly in the absence of a social welfare function for society as a whole. In formal terms, we simply cannot attach any figures to some of these factors so as to have any hope of either realism or acceptance - and, judging by the behaviour of the profession, extensive education in formal economics would not be of much help in securing universal agreement either. The reason is that value-judgements, and especially political ones, are both significantly involved and the subject of strong emotions.

It is, however, possible to recognize that efficiency, like beauty, can appear in many different forms; and that, while many of these cannot be measured, it is possible to construct quantitative indicators of most of them. Thus, for example, it is not necessary to value human life in order to construct a death rate per 10 000 man-hours worked. It is not necessary to value ship's time in order to produce statistics of turnround time. If it is impossible to express some environmental effects in any physical terms at least it is possible to survey peoples' opinions and thus to gauge public reactions to proposals. Where constitutional arrangements permit, there can be referenda, though this is unlikely and the author knows of no precedent anywhere.

It is therefore suggested that the objective of seaports should be specified as:

> "the maximisation of their efficiency in as many different ways as seem appropriate, subject to such constraints as keeping the law and producing sufficient revenue to cover all costs, including the opportunity cost of capital".

It is not claimed that this will produce ideal results: it is suggested that it can lead, quite economically, to a number of significant improvements, from the points of view of the users of the port, of those who work there, of those who live nearby and of the taxpayers.

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* This passage should be read more as a description of the limitations of cost-benefit analysis than as an attack upon it. Cost-benefit analysis should indeed be developed as a tool for clarifying issues and assisting decision-makers: it can rarely do much more.

ANNEX TO CHAPTER 7

Extract from L.H. Klaasen and N. Vanhove, "Macroeconomic Evaluation of Port Investments" in R. Regul (ed), The Future of the European Ports, Bruges, 1971, vol. II, p. 543.

In practice, the tariff system of a port is very often used as an instrument to make the port attractive relative to alternative ports. The arguments used to defend this policy are identical to those used for large investments in the technical equipment and other qualitative aspects of the port. It is said that low rates attract ships and thus goods flows attract industry. The larger and more varied a port becomes, the more attractive it will be as a location for industries which again, in turn will create other activities etc.

It is useful to consider this argument somewhat more in detail in order to get a better judgment about the degree of its reality.

The argument runs thus: make the port cheaper, then the raw materials will be cheaper, then industry will locate and create income that otherwise would not have been created. This income is more important than the losses made in the port which losses arrive from the fact that the rates are too low for normal exploitation. The argument is thus that indirect income created by low tariffs is so large that subsidization of the port pays.

It does not follow from the argument how large such a subsidy should be and one even could say that it seems, following the line of reasoning above, that the situation for the port gets more and more favourable, the heavier the subsidy is. Since these considerations lead to nonsensical results, the best way to attack the problem is to try to determine the optimum degree of subsidization to be given to a port in view of the secondary effects of industrialization.

Suppose that $p = D(V)$ is the long-run demand function for port services, including those created indirectly, and $C(V)$ is the long-run social cost function.

The long-run gross contribution of the port to total welfare (consumers' surplus) equals

$$\int D(V)\, dV - pV$$

The costs for the society as a whole (the long-run social costs) are $C(V)$ and consequently, the profit made equals $pV - C(V)$.

The contribution of the investment to the society as a whole thus equals

$$\int D(V)\, dV - pV + (pV - C(V)) = \int D(V)\, dV - C(V)$$

This expression reaches a maximum for

$$D(V) - C'(V)$$

or

$$p = C'(V)$$

i.e., that the contribution of the port to the society as a whole reaches a maximum if the rates charged are equal to the marginal costs. Since it may be assumed that average costs are constant in the relevant area, marginal costs equal average costs and consequently, the price should equal the costs. It follows that the optimal degree of subsidization of a port is zero.

Chapter 8

CANADIAN SEAPORTS TO 1982

8.1 Introduction

Canada is a federation with a written constitution. In every federal constitution there has to be a residual power saying, in effect, that everything not specifically allocated to one or the other is to be looked after either by the federal government or by the states or provinces of which the country is composed, as the case may be. Constitutions commonly last for centuries and, because no one can foresee which issues will grow to importance over such long periods, the significance of these residual powers is bound to increase. In Canada, the residual power lies with the federal government - unlike the U.S.A., where it lies with the individual states. Shipping and navigation, and thus ports, are explicitly a federal responsibility, but the constitution leaves open the form in which this is to be exercised.

Given the geography of the country, this is certainly a sensible provision. Were it otherwise, then seaports located in the provinces on the east and west costs could exploit their position vis-à-vis the central provinces. Had this occurred, it would probably have been modified (but not eliminated) partly by competition between the several eastern provinces concerned, partly by the summer use of Hudson Bay ports (which would then have been more developed) and, most of all, by such U.S.A. ports as Seattle, New York and Baltimore. Probably, railroad routes would then have been quite different and fissiparous interprovincial feelings would probably have had major political effects.

8.2 The Administration of Canadian Seaports to 1936

The constitutional possession of responsibility does not, however, provide any guarantee that it will be efficiently discharged. Sometimes, as at the numerous 'Public Harbours'*, the port facilities and administration are relatively simple; what needs to be done is fairly obvious; it is done and some charges are subsequently collected from the users, as in a yacht marina. The federal staff is extremely small - possibly even part-time - and few if any problems remain. The possibility of leasing-out the overall operation of such places may be considered, but the lessee's security will be lacking if the lease is short and competition may be lacking if the lease lasts as long as the principal assets. One way out of this is for the

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* These serve mainly fishing, pleasure and coastal craft. Some are virtually one-user, so that the port's consumer provides his own facilities with little but safety and navigational aids coming from the state.

federal government to construct and own the infrastructure (breakwaters, quays, jetties and so on): but these may not always suit the lessee's approach to business. He may want to link a marina with a chandlery store, restaurant and hotel, all built and arranged in accordance with his own ideas. Are these to be provided at federal expense? What then is to happen if his lease is not renewed? Is there any logical basis for compensation? Such problems are outside our main theme and might be explored by small-scale experiments, well-monitored and reported for copying (or avoiding) elsewhere.

Notwithstanding the federal responsibility for ports, much early port development in Canada was carried out by the initiative of private companies, railroads and municipalities, often with governmental authority including the power to levy tolls and dues on vessels and goods. Some of these developments were initiated by, or subsequently transferred to, the local authority concerned. Harbour Commissions were also established, both before and after Confederation in 1867. After that date, most commissioners were appointed by the federal government, though they were usually local businessmen who supported the political party having power in Ottawa. For the most part, they still are.

There is no doubt that all this left much to be desired, in terms of both the physical layout and construction of port facilities and of administration. Most of the facilities consisted of finger piers supported on wooden piles. Given Canadian natural resources, these were cheap and easy to construct but as ship sizes increased they provided inadequate depths and were more easily damaged. They were quite unsuitable for most unit loads, which produce high point loadings (e.g., under the front wheels of forklift trucks) and generally require concrete decks. They were also susceptible to decay and impossible to inspect adequately. The national administration was sketchy.

The situation was examined in the Gibbs Report*, which revealed varying and often inadequate standards of financial control. Sometimes, for example, maintenance costs were represented as capital expenditures, with the resulting 'assets' being used as collateral for bank borrowings; if the banks knew what was going on (which, given the small business communities in many Canadian cities, would not be surprising) they did not feel concerned since they regarded the federal government as a guarantor. A wide variety of wholly unsatisfactory situations were revealed in the Report.

Given the Constitution, the fault must be regarded as lying at the centre. The supervisor of Harbour Commissions controlled some 14 port authorities with a total staff of one clerk and two typists**. While this may possibly have represented a remarkable achievement in minimizing costs, it can only have been secured by minimizing the activity as well. Generally,

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* Sir Alexander Gibbs, National Ports Survey, 1931-2, Ottawa, 1932.

** Report of Debates, 1936, vol II, p. 412, Ottawa; speech of the Hon. C.D. Howe.

it appears that there was no sense of purpose in federal port policies at this time, an accusation which might be levied in respect of later periods.

In the depression years of 1929-32, the system virtually collapsed under the burdens of its own inefficiency and of fixed-interest loans in a period when both prices and the volume of trade were declining. It is hardly surprising that Sir Alexander Gibbs made sweeping recommendations towards a more centralized and tightly-controlled approach.

8.3 The National Harbours Board Act of 1936

This Act disbanded the Harbour Commissions at Montréal, Quebec City, Trois Rivières, Chicoutimi, Halifax, Saint John, N.B. and at Vancouver and substituted control by a board in Ottawa, having three full-time members*, all appointed by the Governor-in-Council. At the time, these ports covered some two-thirds of Canada's overseas trade. In due course, NHB control was established at Port Colborne and at Prescott, Ont. and at Port Churchill, Man. on Hudson Bay. In 1965, St. John's, Nfld., and in 1967 Belledune, N.B., were added and, at other times, Sept-Îles on the lower St. Lawrence, Baie-des-Ha! Ha! on the Saguenay River and Prince Rupert, B.C. Generally, the NHB had full powers to act as a port authority in each of these, though with navigation aids, ice-breaking and certain other safety functions being performed by the Coast Guard and with both capital and maintenance dredging (and sometimes other infrastructure) being generally provided, free, by the federal Department of Works. The local advisory councils which the Gibbs Report had strongly recommended** were not instituted until the mid-seventies and then only in an attenuated form; though termed "port authorities" they had very little authority and very few were fooled by the measure. Had this been done earlier, with a due sense of purpose and so as to give them some real power then a good deal of controversy and ill-feeling might well have been avoided; had they been brought within a national port planning framework (which Gibbs never considered in any detail) then it is possible that the Canada Ports Act of 1982 might not have been needed.

Thus, for example, at such ports as Halifax and Vancouver, far-distant from Ottawa; NHB staff found their loyalties torn between it and the communities in which they lived. Major decisions often took a long time*** and this compared poorly with the Harbour Commissions. (See below for an example with singularly unfortunate effects.)

The Gibbs Report had advocated standard forms of accounting - and considering what Sir Alexander had discovered this is not surprising. The

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* Four since 1955.

** Gibbs Report, p 31.

*** In 1978, an NHB official at Vancouver said to me: "it may be only 3 000 miles to Ottawa but it seems like 30 000 miles back again".

NHB, however, went further and imposed standard charges at all the ports* under its control, thereby removing their most obvious and effective marketing tool from their port managers. This unimaginative approach was extended into a general weakness in marketing, apparently because it was felt that if it succeeded in promoting any one port there would be complaints from all those who felt themselves to be losers. Far from being a success, this approach generated such resentment in Halifax and Saint John, N.B., that local people created 'port commissions' solely to promote their own port's services. After a while, the NHB responded by establishing its own marketing efforts and some amity was restored. These specific complaints apart, the NHB seems to have had no real sense of direction or of purpose.

8.4 Harbour Commissions

Meanwhile, the remaining Canadian ports remained under Harbour Commissions, consisting mostly of federally and municipally-appointed local businessmen and under the general control (e.g., as regards major borrowings) of Transport Canada in Ottawa. Their powers were derived from different and sometimes inconvenient and inconsistent statutes. For several of them, reform came under the Harbour Commissions Act of 1964, which provided that Commissions could be established and re-established by Order-in-Council and on fairly standard bases. While their powers were similar to those of the NHB and their by-laws could be their own invention, they were still subject to federal approval for such major matters as borrowings and large-scale port developments. In practice, however, and in notable contrast to the NHB, approvals were fairly easy to obtain and relations with Ottawa generally good.

This may well have been because the federal government felt that it was necessary to have a much closer control over the public funds lent to the NHB than over the bank borrowings of the Harbour Commissions. Even in macro-economic terms, i.e., considering national income, employment and inflation, this position is very doubtful, if only because both bodies are arms of the same government; in terms of port planning it is absurd, since the resulting expenditures would employ similar Canadian resources. Nor did Transport Canada exercise much effective coordination between the two types of port administration, e.g., in respect of competing investments. Again there seems to have been an absence of carefully considered policies.

An example of this lies in the roughly simultaneous development of container terminals at Vancouver and at New Westminster (Fraser River Harbour Commission) some 10 km away, when it might have seen that:

a) most of western and central Canada's container traffic went, and would probably continue to go, through Seattle because of the wider range and frequency of services available there; thus, though there might be a case for one container terminal to serve the Vancouver-New

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* Except Vancouver. It is probably no coincidence that this was generally the most and sometimes the only profitable port under NHB control.

Westminster-Burnaby conurbation and inland points, there was no case for two;

b) since Vancouver harbour (Burrard Inlet) has natural deep water while the Fraser river requires dredging and is thought to be incapable of sustaining a depth of more than 12 m with or without training walls and there was, at the least, a strong possibility that the size of deep-sea container ships would continue to increase, Vancouver was naturally a better site;

c) advantage might have been taken of the opportunity to renegotiate the "beneficial owner clause" which the B.C. port employers had agreed with the ILWU and which effectively prevents the development of off-dock consolidation depots for LCL shipments in British Columbia; pending this renegotiation permission might have been refused for both terminals. Matters would have been complicated by neither port authority being a member of the employers' association concerned or otherwise a party to the agreement in question, but it cannot be said that they were uninterested or that the agreement had no effect on the prospective volumes of trade. Certainly, they could have used their good offices in promoting the general efficiency of their ports.

The result was that the Fraser River Harbour Commission has had since 1975 a full-scale container terminal which is seriously under-used. (When I visited it in February 1978, I found that it had handled containers only on its opening day and that merely was for the benefit of photographers.) It was not idle because the ingenious port officials had not only obtained the gantries very cheaply* but had arranged for them to be suitable also for structural steel imported from Japan; nevertheless one of them admitted that the terminal was "a bit of an embarassment".

It is worth noting that none of this need have caused concern to the bank from which the Commission borrowed because their primary concern was not with the financial viability of the specific investment they were being asked to finance: it was with the ability of the Commission to service the loan**. This is therefore an example where the Morton's Fort approach is wrong: yet that is what seems to have been used. This episode thus exemplifies the need for coordination of planning between as well as within ports, even to the extent of occasionally prohibiting proposals which appear, at a quick glance, to be self-financing.

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* Fraser River Harbour Commission, Annual Report, 1975.

** The bank was right. In 1982, the Commission reported that they had paid off all their debts.

8.5 The Development of Port Policies to 1982

In the light of this situation, with many provinces and cities feeling a desire for more influence over their ports, and able to point to serious inadequacies in the existing system, the 1974 speech from the Throne announced a major bill to reorganize the NHB's ports, integrating these into one system with the Harbour Commissions.

Other, mostly minor or single-user ports in Canada were controlled under the Canada Shipping Act or Part 12 of the Government Wharves and Piers Act, both being administered by the Department of Transport.

As that Department frankly said:

> "Present arrangements often do not provide adequate means of ports to adapt ... or to plan and finance improvements ... Nor do they enable the Federal Government to direct port development on a national basis or to co-ordinate ports with other transportation modes. Moreover, growing municipal, regional and provincial interest in, and concern for, port operation and development has added to the pressures for a reorganization of the Canadian port system".*

The Scott report recommended a single comprehensive ports organization with national policy and planning functions but incorporating substantial local autonomy for major ports together with some measures of regional participation in planning, all to be integrated within Transport Canada. Financial self-sufficiency would be achieved in due course and it was understood that many chronically unprofitable ports would have their debts cancelled.** Adjacent ports, such as Vancouver and New Westminster (Fraser River Harbour Commission) would be considered for merging. It was not clear what, if anything, was to be done about the rivalry of Halifax and St. John, N.B.; nor of both these with Montréal. Nor was it clear how the increased local autonomy was to be integrated into a system intended to serve Canada as a whole, when many might consider that coordination and autonomy are at opposite ends of a spectrum. Nor was there any attempt at indicating how the necessary reconciliation would be achieved.

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* Dept. of Transport, Canadian Ports: A New Management, Ottawa 1976. (Scott Report).

** Within the NHB ports, any failure to pay interest to the Receiver General was added to the next year, with interest. An unprofitable investment which was not covered by cross-subsidization from elsewhere in the same port thus presented a growing burden.

Bills embodying such provisions were drafted, presented to the federal Parliament* and lost for one reason (including an election being called) or another. In 1982, at the fourth attempt, such a bill was passed. Immediately prior to this, the 15 NHB ports (which included some no more than grain elevators) were handling some 50% by weight of Canada's waterborne commerce, the Harbour Commission ports 20%, while some 500 smaller ports handled another 20% and the remaining 10% were handled by private facilities.

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* E.g., Bill C-6 of 1978.

Chapter 9

THE CANADA PORTS ACT, 1982

The Royal Assent was given to this Act on August 4, 1982. It is intended* to enable the achievement of a port system that effectively supports Canadian international trade objectives and social objectives, national, regional and local; is efficient; provides equitable access and treatment for the ports' users; provides a high degree of local autonomy in management and operation consistent with Transport Canada's responsibility for integrity and efficiency of the national port system, and the optimum deployment of resources; and is coordinated with other marine activities and modes of transport. This is thought to require local (corporate) port authorities at major ports, (i.e., the big NHB ones and most Harbour Commissions) where there is sufficient local interest and financial self-sufficiency is in prospect, the administration of the remainder on a divisional basis and the establishment of Regional Advisory Councils to provide advice on port developments.

Given the situation described in Chapter 8, this all seems eminently sensible, provided that the international trade and social objectives referred to are themselves compatible, that 'the optimum deployment of resources' means what it says and is not mere verbiage and that conflicts are avoided between the autonomous ports, the Regional Advisory Councils and Transport Canada itself. It should be noted, in this context, that some Canadian localities have a long history of borrowing provincial or federal funds for port developments and which they do not succeed in repaying adequately. There are frequently controversies over this, with a variety of public bodies (the Wheat Board, for example) becoming at least peripherally involved. Indeed, there are dangers that the results of proper investment appraisals of the kinds implied in Chapter 7 above would be systematically avoided by people taking the political route** - i.e., getting local politicians to persuade the Minister directly, more or less regardless of the ecoromic and financial evidence, to put up the funds for a project thought to be dear to the hearts of local people.

This Act differs from some earlier proposals in which ex-NHB ports and Harbour Commissions would be brought together in the same organization.

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* This and the next sentence summarize part of the leaflet: Canadian Ports Legislation, Transport Canada, 1982.

** This passage should not be taken as implying that there is anything unique in this. Britain currently possesses the world's largest suspension bridge because an election was due.

The ex-NHB ports continue to be administered by a Crown corporation, while the Harbour Commissions continue under their own statutes (Hamilton and Toronto for example) or under the Harbour Commissions Act of 1964. Appropriately, the NHB becomes the Canada Ports Corporation, virtually as a holding company, with its part-time directors appointed by Order-in-Council from amongst those who represent broad regional interests in port matters. This board may then establish local port corporations at former NHB ports where there is sufficient local interest and a probability of financial viability. These are intended to have a large degree of autonomy - though section 6.6 of the Act gives the Corporation power to give directions to a local port corporation "for the purpose of achieving the objective of the national ports policy", and section 6.8 gives the Minister power to wind up any local port corporation.

Moreover, Section 10 of the Act gives the Corporation power to make bylaws for the management and control of itself, its employees and of the harbours under its jurisdiction, and power to set rates or tolls in ships and goods using their ports. These bylaws are intended to include specifications of the maximum ivestments for which the local body can award a contract; clearly this could be used restrictively. Were such powers to be used extensively then there would be precious little autonomy left for the local bodies: were they merely a fall-back position to be preserved and rarely used it would be different. It might be argued that only the latter was really consistent with the proclaimed objectives of the Act.

The local port corporations established under section 15 of this Act* are financially independent bodies with part-time, paid directors, appointed on the recommendation of the Minister after consulting the parent board and representing the regional and local population and interests in the management of the port**. Their bylaws will be subject to approval by the central body (section 15). Again (section 15(1)(e)), there is a power to impose and collect tolls and rates on ships and cargoes and this is extended (section 17(1)(a)) to fees or charges for the use of property, or for any service it provides and (section 17(1)(b)) to storage charges. Moreover, from the use of the phrase "management and operation" in the first paragraph of this chapter (and which is used in section 3(1)(d) of the Act) it appears that local port corporations could, if they wished, enter the field of cargo-handling (NHB has, of course, been in the business of operating grain

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* This creates a new schedule to the Act it is amending.

** Taking 'interests' literally, the Port Corporation established for Vancouver on July 1 includes the leaders of both the employers' association and the port trade union - Canadian Press wire service 13.06.83. It remains to be seen how well people who are occasionally in disagreement in one forum (Vancouver is very largely a landlord port) can work together in another one. The experience of Britain (e.g., British Steel) is not discouraging, though great optimism is not justified either.

elevators for many years) and to any extent they wished: experimentally, perhaps*.

Local port corporations may borrow from the federal government, for fixed (section 27) and working (section 28) capital on such terms as Ottawa may approve or (section 29) from the Corporation itself. Clearly this could be made a tough option by comparison with other sources, such as those traditionally used by the Harbours Commissions - and which (section 30) they may also use, though still subject to approval from the Minister of Finance. Alternatively it could become normal practice.

Part II of the Act makes broadly consistent provisions concerning the public harbours, i.e., those not under the Canada Ports Corporation or the Harbour Commissions.

Part III of the Act similarly amends the Harbour Commissions Act of 1964 to bring it into line with the new policy and Parts 4, 5 and 6 make minor necessary provisions for the Canada Shipping Act, the Fishing and Recreational Harbours Act and for transitional purposes.

Overall, therefore, the Act provides for a new, consistent and flexible form of port organization to be established. The remaining question is how it should be used and it is to this that we now turn.

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* It is curious that this point is not mentioned in Transport Canada's explanatory brochure Canadian Ports Legislation, Ottawa, 1982.

Chapter 10

THE FUTURE: PROBLEMS AND OPPORTUNITIES

10.1 Local Autonomy and Coordination

The language of the 1982 Act is, at least by contrast with the earlier statues, so flexible that it can be interpreted in many different ways. To take one practical example: if both the Canada Ports Corporation and the local ports can make bylaws covering the charges to be levied on ships and cargo, whose will predominate? Obviously, the Ports Corporation will do so in the event of conflict (which would itself indicate a dangerous situation probably extending more widely than pricing policy): but is there to be any continuation of the NHB's practice of uniformity?

If so, then it may be deplored as restricting local autonomy and failing to reflect in charges the levels or patterns of either demand or cost at any of the individual ports, besides continuing an unfortunate contrast with the freedom of the Harbour Commissions. But if the price-setting powers are to be exercised locally, what principles are they to follow and who is to determine them?

This flexibility is welcome in allowing both Transport Canada and the Canada Ports Corporation to respond to changing needs and circumstances. How are they to be coordinated with competing Harbour Commission ports? The prospect of these changes can be studied but it is quite unreasonable to suppose that they can be forecast as to nature, extent or timing. (For example, if we are to have 250 000 tonne dwt grain carriers, it would probably have a significant effect on the current controversy concerning the redevelopment of Port Churchill when the maximum depth there at low water is 9.14 metres and the largest ship to have loaded there lifted 44 170 tonnes*; and an equal effect on the plans for the St. Lawrence dredging programme.)

The danger of this flexibility, however, is not that there may be no principles at all in the practical administration of ports policy but that the principles may be developed ad hoc, i.e., without proper consideration and consistency. It is consistency of principles that is being advocated: not the uniformity of practice exemplified in the NHB's policy for port charges.

All this may be consistent with local autonomy in the application of these principles - and also with the inclusion of representatives of the provinces and cities in which the ports are situated. After all, if such

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*"Uniwersylet Gdanski", reported in Ports of the World, Lloyds of London Press, 1982.

Harbour Commissions as that of the Fraser River can have two members elected* by the nine municipalities concerned with their area of operations, why cannot this be done for local port corporations? Why should provinces not be represented through appropriate nominees?

In this connection, it may be borne in mind that the management and development of a seaport is rarely of sufficient controversy to become an electorial issue. Even in New Zealand, where the controlling or 'policy' boards responsible for major ports consist of people directly elected by the voters in specified areas near the port, and without any staggering of retirements to encourage continuity, the elections are rarely contested, re-election is extremely common and members of different parties tend to work together as a team**. Continuity is thus secured anyway.

It may, therefore, be argued that the principles upon which the Act is to be operated need to be specified, carefully but in general terms; and that these principles should then be applied by the local port corporations in their own contexts. These several principles might cover a wide range of matters, e.g., safety standards, hydrographic and hydraulic monitoring, vessel traffic management, environmental standards, public access, personnel policies, efficiency monitoring, pricing and investment appraisal. Authority for the devising and specification of these seems to lie in Part 1, section 2 of the Canada Ports Corporation Act, 1982 which amends section 3 of the National Harbour Board Act, 1936, to state that Canada should have a port system that is efficient. The word "system" presumably means that it is in some sense systematic as distinct from being atomistic and the concept of local autonomy presumably means the general principles associated with the system should be subject to interpretation in the light of local circumstances. Finally, the phrase in section 3 (1)(d) of the Act as amended, referring to all this being consistent with:

> "the responsibility of the Minister to ensure the integrity and efficiency of the national ports system and the optimum deployment of resources",

apart from confirming the interpretation suggested here contains words which are difficult not to apply in economic, as in other, senses. The optimum referred to is presumably the optimum from a Canadian point of view, so that subsidies whose benefits accrue partly to non-Canadians might be regarded as being placed in grave doubt, if not actually ultra vires.

It may, therefore, be suggested that the formulation of such general principles might form a most important task for the early years of

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*The elections are unanimous, being the result of a meeting convened by the largest municipality and with a run-off if the first ballot is not unanimous. Such results are encouraged by the residual power of the federal government to make its own appointment if unanimity were not achieved; thus destroying all municipal representation.

**R.O. Goss, A Comparative Study of Seaport Management and Administration, London 1979, Vol. II, p. 157.

the new Corporation. In the economic field this might especially apply to such questions as pricing policy, investment appraisal and the basis for lease rentals, both initially and in respect of subsequent reviews.

Should there be charges levied on cargo? (Antwerp, a general cargo port with one of the highest levels of technical efficiency in the world, has none.) If so, upon what basis? Should there be charges levied on ships and, if so, should they be levied on gross tonnage, net tonnage, deadweight tonnage, ship's length* or what? What period of time should be covered? It may be noted that one success of the former NHB lay in encouraging rapid ship turnround by having a charging period as short as 12 hours - though they came to be beaten in this by the Israel Ports Authority, charging on four-hour periods** and by the Port of Singapore Authority (PSA) which charges 'dockage' per 100 gross registered tons per hour alongside***. These charges are, however, modest and it is not clear that they have much effect. Neither of these bodies is a landlord port (save PSA at a very limited number of berths); if they resembled Canadian ports in that respect it might be considered whether the conventional charges should be abolished, on ships or cargoes (or both), and the lessees' rents increased accordingly****.

Similarly, the approach to investment appraisal needs to be considered. Should this be done on a purely cash basis: or should it include externalities, e.g., by way of cost-benefit analysis? If the former then it needs to be based on socially optimal prices. It is important that the investments should flow from the prices and not the other way around. It is not sufficient for some 'on-cost', 'allowance for overheads', or 'capital charge' to be added to the specifically identifiable escapable costs so as to make the investment viable.

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*As in California.

**Goss, op. cit. p. 212.

***Goss, op. cit. p. 285.

****cf the Report of the Committee of Inquiry into Shipping (Rochdale Report), Cmd 4337, London 1970 at Ch. 11: "To be specific we...consider that the basic principle for any charge levied upon ships should not be derived from gross tonnage, net tonnage or any similar measure which might be devised. To do so within a port of any size necessarily involves large scale cross-subsidization between berths and port facilities of different qualities. We see equal harm in the charges being levied for lengthy fixed periods of time such as a week or more.

In principle we consider that the charge payable by the ship operators should be related to the length of time for which his ship uses the port facilities and to the nature of the facility required. In this way the charges paid by a ship would be related to the costs incurred by the port authority in providing them."

This passage was not, of course, written in the context of landlord ports.

Equally, it is important that an appropriate regime be established for financial reporting. The local port corporations will, of course, publish their own accounts and it has been suggested in Chapter 8 that in an age of inflation this involves reflecting real and not just money values. It is important that different ports, while being allowed to innovate, should report within a standard format so as to permit comparison and consolidation for the accounts of the Canada Ports Corporation overall. Finally, it is important that the local ports corporation be encouraged to identify activities within their own operations and to account for the costs and revenues directly associated with each - i.e., to follow the ordinary commercial practice of budgetary control within profit centres where this is practicable and of cost centres where it is not - e.g., in respect of their own head office.

10.2 The Monitoring of Efficiency

The systematic construction of such profit and cost centres may be associated with some of the physical measures of efficiency. (The ports may well remain largely landlords, but the Act says that it is the port system, not just the local port corporations, that are to be efficient.) It is, therefore, desirable to erect a wide variety of efficiency indicators covering such matters as ship turnround time (suitably disaggregated between ship types and sizes), berth productivity, labour productivity and so on, matching some of these with the financial measures of efficiency so as to produce, ideally, both average and marginal costs. It should not be thought that a large staff is needed for this; even before the age of micro-computers, the Israel Ports Authority produced and published what is probably the world's best set of port efficiency statistics with a staff of three people, of whom one was a qualified statistician, plus one or two people in each of their three ports. Most of these statistics are produced monthly as well as annually and they especially distinguish important seasonal effects such as the movement of the citrus crop.

A considerable amount of work has been done on port efficiency indicators in recent years, much of it emanating from UNCTAD and intended to assist developing countries. The national characteristics of Canada may well render necessary the development of indicators which are relevant to its own problems: they do not justify failing to mount a systematic approach to this subject, with or without the acceptance of the arguments in Chapter 8 to the effect that maximizing efficiency is the only seaport objective which withstands examination.

Since the Department of Transport rather than Ports Canada, is responsible for the Harbour Commissions, and since this system of efficiency monitoring should be applied to both, it follows that the Department should have overall responsibility for ensuring that appropriate arrays of efficiency indicators are produced. These may well fall into three main classes:

a) Physical indicators such as slip queues, turnround times, tonnes of cargo handled per day at each port facility and labour productivities, strike record and equipment downtime;

b) Financial indicators such as gross and net revenues and cost per tonne of each type of cargo, return on investment, operating margin (net operating income as a proportion of operating revenues), operating ratio (ratio of operating expenses to operating revenue) and for each type of activity or profit centre; and

c) Economic indicators such as revenue and earnings - standardized measures of labour productivity and measures involving value added per employee, per dollar of capital and per dollar of wages bill.

Once developed, these indicators should be published, for each port, and preferably at quarterly intervals. (The example of the port of Los Angeles might well be followed in this respect; it seems to suffer little by doing so, despite its neighbouring competitor, Long Beach, being much less informative!) They should be published in a format which readily provides for both longitudinal comparisons (through time) for any one port and cross-sectional comparisons (with other ports). In this way, the Department of Transport, and the Canadian public can see what is being done with their ports and with the money they have effectively guaranteed. In this way, they can observe the extent to which ports are serving Canadian interests. In this way, ports' users can make comparisons so as to choose the most efficient for their purposes.

10.3 Public Sector Involvement in Ports

Much of the earlier argument in their paper and especially that of Chapter 8 concerning subsidies, may have suggested that the general tenor of this paper is towards restricting public sector activities to those of the minimum or necessary activities described in Chapter 4, of providing property rights, planning, public goods, looking after such externalities as pollution and effecting a sensible competition policy. In fact, however, Chapter 6 described a wide diversity of activities taking place in seaports without reaching any conclusion on the optimality of this save that it should suit the general situation of the country concerned. It would, indeed, be a gross misrepresentation of the thesis presented here to suggest either that this paper suports any general expansion of public sector activities in seaports or their minimization subject to certain constraints. But the country in question is not an abstraction: it is Canada, which has certain traditions, philosophies and laws.

In these circumstances, it would be difficult to argue for anything but a general continuation of the present system of landlord ports, i.e., with leases (with rents at proper, unsubsidized, levels and subject to review every few years) to private sector operators who may be allowed to exploit economies of scale but are not allowed to limit competition, e.g., by colluding on prices. There are, however, many other activities in which central, regional and local port authorities should take part.

These go beyond those already covered, and also the standard regulatory activities of safety, police, fire and pollution control. They may include:

a) Producing and publishing rolling forecasts of national seaborne trade, in tonnes or other suitable physical measures*, suitably disaggregated and covering, say, one and five years ahead;

b) Maintaining a watch on the implications of technical progress, e.g., in ship sizes, types and cargo-handling techniques. As an extreme example of this, the municipally-owned port of Hamburg owns a (deliberately) loss-making subsidiary as one of its own lessees, the Hamburger Hafen-und-Lagerhaus Aktiengesellschaft (HHLA), covering some 10% of the ports' trade and consciously used as a technological innovator. A parallel example exists in the competing port of Bremen. It is rather doubtful whether this should be copied on a large scale, but one or two Canadian ports might experiment along those lines, with the results of the innovation being published (and without the operation being used to conceal subsidies) An alternative would be the commissioning of forward-looking scenarios, e.g., of ship design trends, from consultants;

c) Despite the drastic reductions in the number of port workers associated with the technical developments described in Chapter 3, section 3.6, there is a need for training in port work; and there may well be sufficient economies of scale in this to justify public sector action. Alternatively, and where there is a sufficiently strong employers' association acceptable to both the local port authority and to the trade unions concerned (such as the MEA in Montréal) this may be done by them. Some participation by the port authorities however desirable, if only in the safety aspects of training, for there is no reason to believe that employers will achieve a satisfactory level of safety without public pressure. Elsewhere, a port authority training organization may be needed and more specialized facilities e.g., on management, might be national. Again, individual ports might be encouraged to pursue different paths, and to experiment;

d) There is disagreement amongst port managements as to whether vigorous marketing of their port, i.e., by themselves, is worthwhile. Some say that it is the business of the carriers using their port and others (in landlord ports) that it is the joint business of the carriers, such inland transport operators as the railways

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*Customs statistics, and especially those concentrating on the value of trade, failing to distinguish by mode of transport or whether in containers are often inadequate. The need, however, is more likely to be for their reform rather than duplication.

and the tenants or terminal operators. Most seem to feel that there is room for a modest and selective marketing effort - and especially since the growth of container consortia raised the economic power of certain port users*. This probably needs to be supplemented by a good deal of information distribution partly derived from the efficiency-monitoring processes described above and some straightforward facilitation; and

e) Just occasionally, there may be a justification for more intervention than is implied in any of these; as, indeed, elsewhere in this paper. This may arise when industrial relations have become chronically bad; or when a large and quite unexpected technical change has rendered massive new investments, of which there is no previous experience, necessary or has rendered large parts of the port obsolescent and under-employed. Serious and long-term social and economic problems may ensue.

It is then possible to argue that the way to deal with a surplus is to keep the market price down so that it is gradually removed; and the way to attract resources to an activity is to reward them well. That, in short, all will come well in the long run if only everything is left alone to cure itself and mistakes investors make are not bailed out at public expense.

A contrary view is that it is better for some public sector body to act as a catalyst in getting firms and people to do what was advantageous for them anyway, and what they were going to do anyway; but to get them to do it sooner and more cleanly than later and after a period of doubt and suffering. Examples lie in the Japanese scheme for compensating owners of unwanted barges and in various publicly-financed schemes for paying-off surplus port workers. This may involve a subsidy and seem contrary to some earlier arguments: but occasions on which such actions are justified should be few and temporary. Careful consideration will always be needed to avoid either errors of principle or of timing. In particular, there is a danger that by the time governments have been persuaded to act, legislatures have provided the necessary statutes, treasuries have allocated the funds and an organization has been established to administer the scheme, the problem will

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*An example is Halifax's "Halterm" terminal's loss of Dart Line as a customer and its securing of Sealand. Without either they would have been in serious difficulties.

have passed*. The examples of this kind of wrong-headed action are as the sands of the sea; and it takes a fairly free and flexible body to avoid them.

10.4 Conclusion

The organization and management of a nation's seaports is, therefore, a continuing and not a temporary process. It cannot be done by passing a law, establishing an organization and approving sets of bylaws. Rather, it requires the continuous application of intelligent and understanding management, itself based upon sound and explicit principles. Precisely because circumstances change, forecasts are falsified and the unexpected all too frequently appears there is a need for flexibility; and it is in the management of this flexibility that underlying principles are needed.

Nor is it true that public sector activities should generally be minimized. Apart from all the arguments presented above, it was not the private sector that developed the mariners' (magnetic) compass in an efficient form: it was Professor Sir William Thompson (later Lord Kelvin); and the same man devised the first efficient deep sea sounding machine. It was not the private sector which induced the production of (much) better ways of finding longitude at sea: it was the British Admiralty. It was not free competition which produced radar: it was a number of warring governments. It was not free enterprise that charted the oceans or collected masses of data on winds, currents and weathers: the first was done by various governments and the latter by Lieutenant Matthew Fontaine Maury of the United States Navy.

It was the private sector which developed much of what we see in, on and around the ships in our ports; but even there the public sector might have played a more active role, e.g., in information transfer. Canada Steamship Lines operating on the Great Lakes were using pallets on forklift trucks loading through sideports and shipboard elevators in the holds as early as 1948. This was reported in a respectable source**, complete with photographs, which analyzed and drew attention to the growing problems, saying:

> "Notwithstanding the very great efforts which are being made at very great cost to increase the speed of ships at sea, it is evident that despatch in port is not correspondingly progressing. One cannot help feeling that the orthodox methods are in many cases somewhat out of date, and if the full benefit of greater sea speed is to be attained considerable improvements in the handling of cargo, combined

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*"...nothing is ever done until everyone is convinced that it ought to be done, and has been convinced for so long that it is now time to do something else": F.M. Cornford, Microcosmographia Academica, London 1908.

**W. MacGillivray "Speed at Sea and Despatch in Port", Trans INA, vol. 90, no. 3, July 1948, pp. 196-7. Doubtless it was reported in Canada too.

with co-operation and economy in the care of labour, are urgently necessary."

Some 22 years later, however, an authoritative committee reached almost identical conclusions and that the balance of effort in research and development as between hydrodynamics and cargo-handling had been wrong*.

The conclusion must surely be that for these reasons as well as those outlined in Chapter 4, a continued application of public activity is needed in Canadian seaports. The Canada Ports Act of 1982, if wisely used, provides the opportunities for doing just that and with admirable scope for adjustment to changing circumstances.

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*Rochdale Report (1970), cit., p. 201.

LOGISTICS OF GRAIN MOVEMENT

by

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LOGISTICS OF GRAIN MOVEMENT*

The system which has evolved for controlling the movement of Western Canadian grain from country positions to export and domestic points where the grain is required for market, is perhaps one of the most complex in the world. The element which renders it unique is the curious blend of competitive commercial interests (represented by the grain-handling companies and the marketers of so-called non-Board or open market grains), monopolistic commercial interests (represented by the Canadian Wheat Board) and centralized, quasi-regulatory interests (represented by the Canadian Wheat Board, the Canadian Grain Commission, the CTC and the Grain Transportation Authority (GTA)).

The system which is used to control this movement is rather loosely referred to as "the car allocation system". In fact, because of the blend of interests referred to above, the system really entails two broad functions:

1. An allocative function, whose objective is to ensure that competing interests acquire what could be called "fair and equitable access" to available transportation; and

2. A logistics management function, whose objective is to ensure that the right grain is in the right place at the right time to meet sales.

The purpose of this paper is:

1. To give a descriptive overview of the grain-handling and transportation systems and the so-called "car allocation" systems; and

2. To describe some of the key shortcomings in the system as it currently exists.

These two purposes are addressed, respectively, in Parts I and II of this paper. Part I is drawn from a paper which was presented to the Canadian Operations Research Society in Winnipeg in May, 1983. Part II is taken from a seminar presented at York University in February, 1982. Due apologies are herewith tendered for the differences in style between Parts I and II. This shortcoming arises because the original papers were prepared for rather different purposes in different forums.

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* This paper was presented to the Canadian Transport Commission on October 13, 1983.

I. ON MATTERS PHYSICAL AND SYSTEMATIC IN CAR ALLOCATION

The Physical System and the Players

Figure 1 shows the steps in the flow of grain throughout the system. Grain is delivered from the farm to the country elevator by farm truck, and from the country elevator to the terminal by rail car (boxcars or hoppers). For movement to the West Coast (Vancouver and Prince Rupert) the next stage is to an ocean vessel. For eastbound grain, the rail movement ends at Thunder Bay and the next leg of the journey is by laker to ports on the lower St. Lawrence River (Montréal, Québec, Baie-Comeau and Port Cartier). By far the largest part of the grain moving by rail follows these two routes and is exported.

Figure 2 gives some idea of the size of the system. There are about 150 000 farmers. They deliver, in total, about 30 million tonnes of grain to country elevators. This entails about 4 million trips to country elevators over the course of the year. About 25 million tonnes are exported and the remainder goes to domestic use. There are about 2 000 elevator "units" (to which farmers deliver grain), comprised of 3 000 actual licensed elevators. An elevator "unit" consists of one or more country elevators that are operated together by a single elevator manager. The elevators are located on 19 000 miles of railway track spread across the three Prairie Provinces and the Peace River area in B.C. The grain moves in a fleet of rail cars composed of just over 16 000 hopper cars, which are owned by the federal government (12 000), the Canadian Wheat Board (2 000), the provincial governments of Alberta and Saskatchewan (1 000 each), and 10 000 boxcars owned by the railways. These cars make just under 500 000 trips each year (about 17 trips each) to deliver grain to port positions. The four major port destinations are Vancouver, Prince Rupert, Thunder Bay and Churchill. The relative volumes handled at these ports are 10 million tonnes at Vancouver, 1.0 m.t. at Prince Rupert, 0.5 m.t. at Churchill, 17.5 m.t. at Thunder Bay, and about a 1.0 m.t. to miscellaneous destinations.

The grain is taken out of the terminals by vessel. At the West Coast, cargoes are typically 25 000 to 50 000 tonnes each. At Thunder Bay, lakers typically take 25 000 tonnes.

The grain is composed of seven different grain types (wheat, durum, oats, barley, rye, flaxseed and rapeseed), but each of these is broken into differing grades. Typically about 10-12 distinct products are ordered forward in bulk over the year, with minor quantities of less common grades handled on a special shipment basis.

This provides some idea of the physical parameters of grain movement. That is the easier part. Now consider the institutional arrangements. These are illustrated on Figure 3. It will be seen from this slide that there are competitive commercial interests in the grain-handling and transportation system. There are, first of all, two separate ways of marketing grains: through the Canadian Wheat Board for wheat (including durum), oats and barley for export or for human consumption domestically; through private grain trading organizations for rye, flaxseed and rapeseed and for domestic

Figure 1
PHYSICAL STEPS IN THE MOVEMENT OF GRAIN

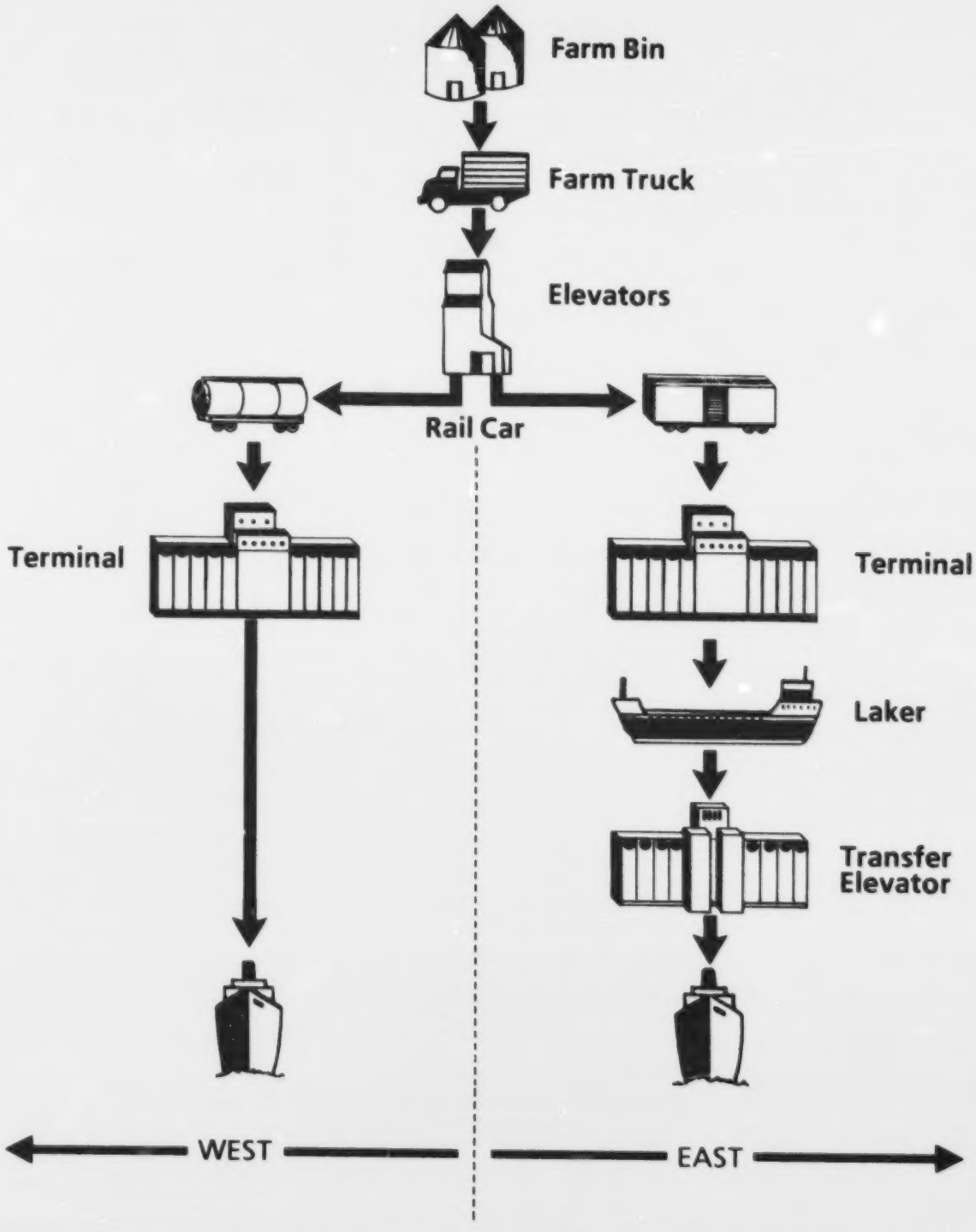


Figure 2
SIZE OF THE SYSTEM

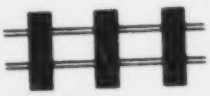
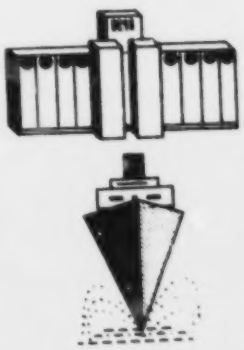
Tonnes Moved:	30 Million (25 Export) (5 Domestic)
Farms:	150 000
Farm Trucks:	4 Million Trips
Country Elevators:	1 975 "Units" 2 935 Elevators
 **Rail Lines:**	19 000 Miles
Rail Cars:	15 000 Hoppers 10 000 Boxcars (17 Trips/Year)
 **Terminal Elevators: Located at the Four Ports**	5 at Vancouver 1 at Prince Rupert 1 at Churchill 12 at Thunder Bay

Figure 3
INSTITUTIONAL ARRANGEMENTS OF GRAIN MOVEMENT

Grain Sold To:

	Wheat Board	**Private Trade**
Marketing	Wheat, Oats, Barley; a) Export b) Domestic Human Consumption	a) Rye, Flax, Rapeseed b) Wheat, Oats, Barley for Domestic Feed
Handling	6 Major Owners (Compete for Farmers' Deliveries)	
Transport	2 Major Railways	
Regulation/ Coordination	- Canadian Grain Commission - Canadian Wheat Board - Grain Transportation Authority - Canadian Transport Commission	

feed grains. The two ways of marketing are quite different. Secondly, there are six major (and several minor) country elevator companies who are competing for the farmers' deliveries. Thirdly, there are two major railways to whom "market share" is now becoming important. So the business of directing grain through the transportation and handling system has commercial considerations as well as considerations of logistical efficiency.

Coordination and Control System ("car allocation")

The task to be accomplished here is first, to move the right grain from the 2 000 country elevator units to terminals at the four port destinations at the right time to meet sales commitments, and second, to move the grain so that all commercial interests have what could be called "fair and equitable" access to available transportation.

Now this very large system, with many different organizations, is no more complex than its U.S. counterpart. However, the underlying philosophy and the techniques used to control grain movement are very different. In the U.S., the grain shippers place their shipping orders directly with the railways, who in turn distribute their cars to each shipper. In Canada, on the other hand, largely because of the centralization inherent in the Canadian Wheat Board system of marketing, we have come to rely on central coordination of transportation, too. The central coordinating responsibilities are referred to as "car allocation", reflecting the concern with making sure that each commercial interest gets its fair share; but in fact the "allocative" part of the process is now inseparably bound up with the logistics process (by which is meant the functions required to get the right grain to the right place at the right time). These functions are shared between the Canadian Wheat Board and the Grain Transportation Authority.

The planning procedures for controlling the flow of grain work on a weekly cycle. Every week a new shipping program is established, and shipping orders are placed at country elevators. It is important to understand the timing of these planning operations. They are shown in Figure 4. On Wednesday of Week 1, there is a meeting with the railways to determine the total number of railway cars that will be available for loading at country elevators in Week 3. Between Wednesday of Week 1 and Wednesday of Week 2, it is decided what will be loaded into the cars from each country elevator. These decisions are translated into shipping orders that are given to the elevator managers and to the railways on Thursday of Week 2. During Week 3, the railway cars are loaded at the country elevators, and the cars are generally assumed to arrive at port positions by Week 4.

A more detailed examination of this procedure follows. Figure 5B shows the major steps in the process, and who carries out each step.

(a) Determination of Cars Needed

The process begins with an analysis of sales and shipping information to determine how much grain of each type should ideally be shipped forward in the week for which the planning takes place. To establish this desirable quantity of grain, the elementary inventory control equation shown in the box in Figure 5A is used,

Figure 4
PLANNING PROCEDURES FOR MOVING GRAIN

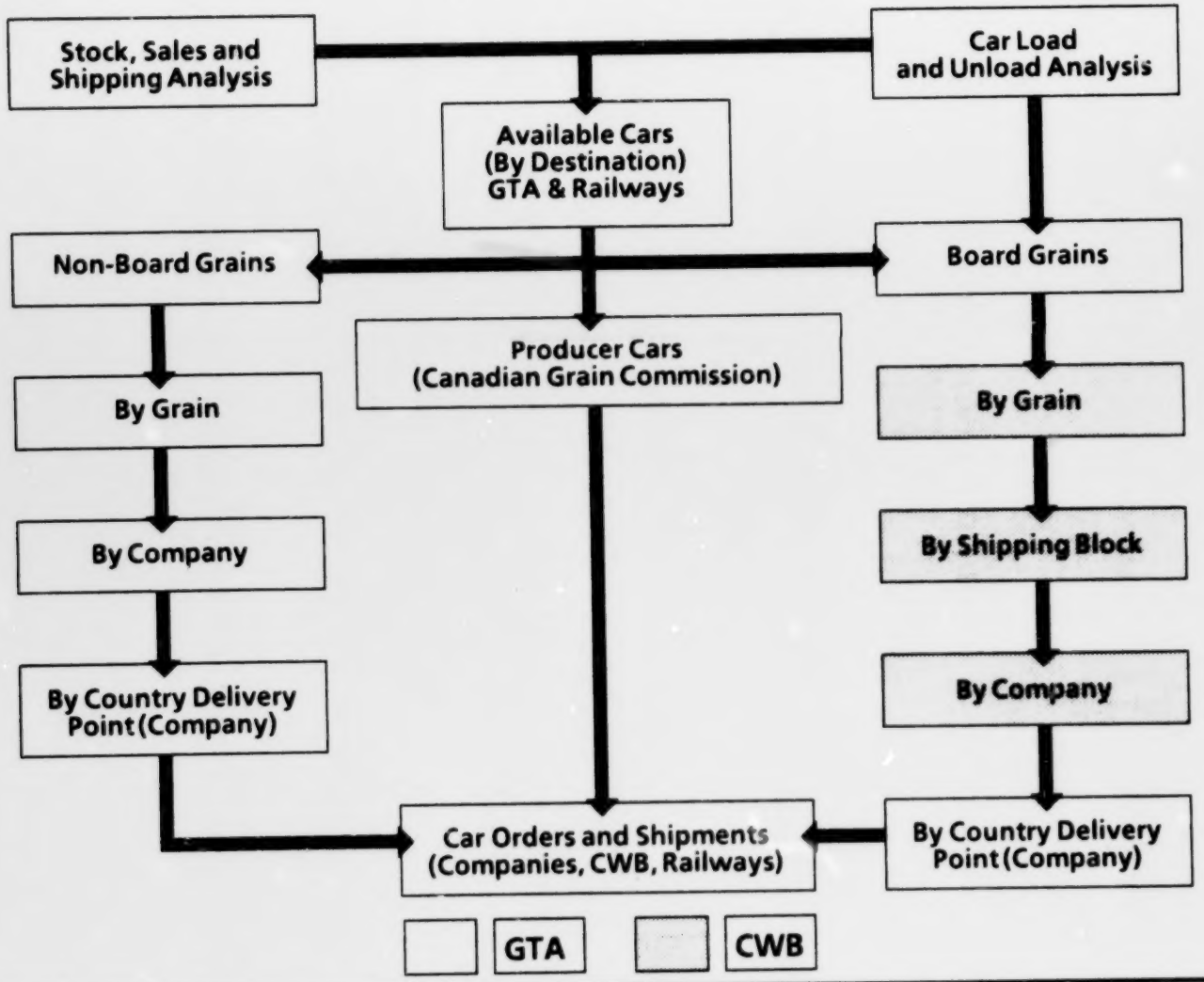
Figure 5A
EQUATION USED FOR INVENTORY CONTROL

Ending Stock = Beginning Stock + Receipts - Shipments to Sales

Beginning Stock + Receipts = Sales + Ending Stock

Beginning Stock + Enroutes + Open Orders + New Orders = Sales + Desired Buffer Stock

Figure 5B
WEEKLY ALLOCATION PROCEDURES



Beginning Stocks	+	Enroutes	+	Open Orders	+	New Orders	=	Shipment to Sales	+	Ending Stocks

It would perhaps be worthwhile to run over each of the terms of the equation:

On the Left-Hand Side:

Beginning Stocks - Are the current stocks of any kind of grain on hand in the terminal elevators at a given port (e.g., Vancouver).

Enroutes, Open Orders and New Orders - Collectively represent the grain that will be received at port over the upcoming weeks. Enroutes, represent the grain now loaded into rail cars and moving towards the port; Open Orders represent grain for which a shipping order has been placed, but which is not yet loaded in rail cars; New Orders are the unknown quantity that is to be determined.

On the Right-Hand Side:

Shipment to Sales - Is the quantity of grain that will be taken away from the port in vessels.

Ending Stocks - Represent the stock of grain that will be left over after the addition of the receipts and the subtraction of the shipments. This quantity is chosen by the inventory manager as the working or buffer stock.

The equation is both a simple mathematical expression of what happens to inventory at any port location, and the basic planning tool which should be used to calculate the new shipping orders that are required to meet sales of each grain. I say "should be" rather than "is" because the rigour with which the planing entailed in this equation is applied varies from grain to grain.

It is worth noting, in passing, that getting accurate information on any one of the terms in this equation is a massive data capture and processing task in itself.

(b) Determination of Car Supply

This step entails determining the actual cars available. Every Wednesday, the Grain Transportation Authority meets with the railways to determine the total number of cars each railway will have available for loading and shipment to each port and to domestic destinations. Among the many factors to be considered in this negotiation are car supply, cars under load, port stocks, vessel arrivals, weather conditions, natural disasters and the labour situation. Some rather difficult decisions must be made when the cars available differ markedly from the cars required as determined in step (a).

(c) The Board/Non-Board Split

Once the number of available cars is known, the Grain Transportation Authority analyzes the position statements (which show sales commitments, orders allocated in previous week etc.) of the private grain companies for oilseeds and rye, and of the Canadian Wheat Board for Board marketed grains (i.e. wheat, oats, barley). For these analyses, the Grain Transportation Authority makes an initial allocation of cars for both Board and non-Board grains.

(d) Allocation of Non-Board Cars to Individual Companies

Cars for all non-Board grains are then allocated by the Grain Transportation Authority to the various handling and shipping companies, based on the number of cars of each grain that are required at each destination according to export sales. Generally, cars are allocated weekly to meet individual shipper's export sales. Following the split of cars between the Board and non-Board sectors, and the allocations for non-Board to individual companies, information confirming the week's allocation is given to each company, and to the Canadian Wheat Board. This is the last step in the allocation process involving the Grain Transportation Authority. The remaining steps are carried out by the Canadian Wheat Board, the grain companies and the railways.

(e) Allocation of Board Cars to Individual Board Grains

At the same time as step (d) is proceeding, the Canadian Wheat Board divides the initial Board allocation among the individual Board grains. The total number of cars allocated to the Board for each port are divided among the various grains under its jurisdiction, based on their sales commitments, vessel arrivals and other factors.

(f) Allocation of Board Cars to Shipping Blocks

In order to make the job of allocating shipping orders to individual country elevators more manageable, it is done in two steps. For this purpose, the elevators are grouped geographically into what are called "shipping blocks". There are 48 of these blocks, each one containing about 40 country elevator "units". The allocation of shipping orders to the shipping blocks is done by the Canadian Wheat Board, based on its requirements for each grain.

The Board cars allocated for each shipping block must then be allocated to each individual elevator company operating in the block. This is done on the basis of the historical handling percentage of each company in that block. The handling percentage based procedure is known as the "Bracken Formula", and it is discussed more fully in Part II of this paper.

(g) Allocation of Cars to Individual Elevators

Each grain company then decides how many orders for Board grain it wishes to allocate to each of its elevators in a given block. The companies also decide which blocks and individual elevators in the blocks they wish to

place their non-Board grain orders which they have received directly from the Grain Transportation Authority. The information is then relayed back to the Board.

Steps (f) and (g) above are carried out from Monday to Wednesday in the week following the initial GTA/railway meeting.

(h) Assembly of Train Runs and Placing of Orders for Car Loading

Finally, all the individual allocations, which are now broken down by grain and country elevator, are relayed back to the Canadian Wheat Board. Here, conflicts are sorted out, and a final "shipping program" is developed that permits the railways to place cars in an efficient manner, taking into account train run patterns, car spotting limitations and so on. This "sorting out" process involves the railways, elevator companies and the Wheat Board, whose "Block Supervisors" coordinate all the necessary last minute changes. This shipping program -- which is known as the "final allocation" -- is completed on the second Wednesday. On Thursday, the orders are placed with the elevator managers and railways for shipment the following week. This system involves the processing of approximately 10 000 orders for shipping grain in a given week.

(i) Producer Cars

The foregoing describes the planning for the major flows of grains. Threaded into this is also a separte stream of activity to provide for allocation of cars to individual grain producers who wish to ship cars directly, bypassing the country elevator system. Applications for producer cars are approved by the Canadian Grain Commission. The Grain Transportation Authority grants first priority in weekly car allocations for this purpose and is required to allocate cars up to a maximum percentage of the cars allocated to any grain, to be made available to producers. The percentage is established by the Canadian Grain Commission. Shipping orders are then issued by the Board which enables producer cars to be integrated into the weekly shipping program.

Now, taken together these steps represent an extremely complex decision process. If an attempt were made to represent the requirements and constraints as a set of mathematical equations, it would be quite complex. Figure 6 illustrates the first step of allocating by block. In this case, the Board has been given an allocation of 2 500 cars for Vancouver. It first must decide how to break the cars up by grain. This is represented by the row totals shown in the column at the right. The allocation to the blocks entails filling in the individual elements of the matrix. In filling in this matrix, there are minimum and maximum numbers of cars that can be allocated to each block (these minima and maxima are set by train run and car spotting constraints), and, of course, maxima that are established by the amount of each type of grain in store in each block. In fact, it is not completely accurate to speak of only one matrix here; there are really two matrices, one for each railway, but the row totals are of course for both.

This, in itself, is not too complex, but each column of this matrix (or two matrices) itself becomes a problem as illustrated in Figure 7.

Figure 6
ALLOCATION OF BOARD ORDERS TO SHIPPING BLOCKS

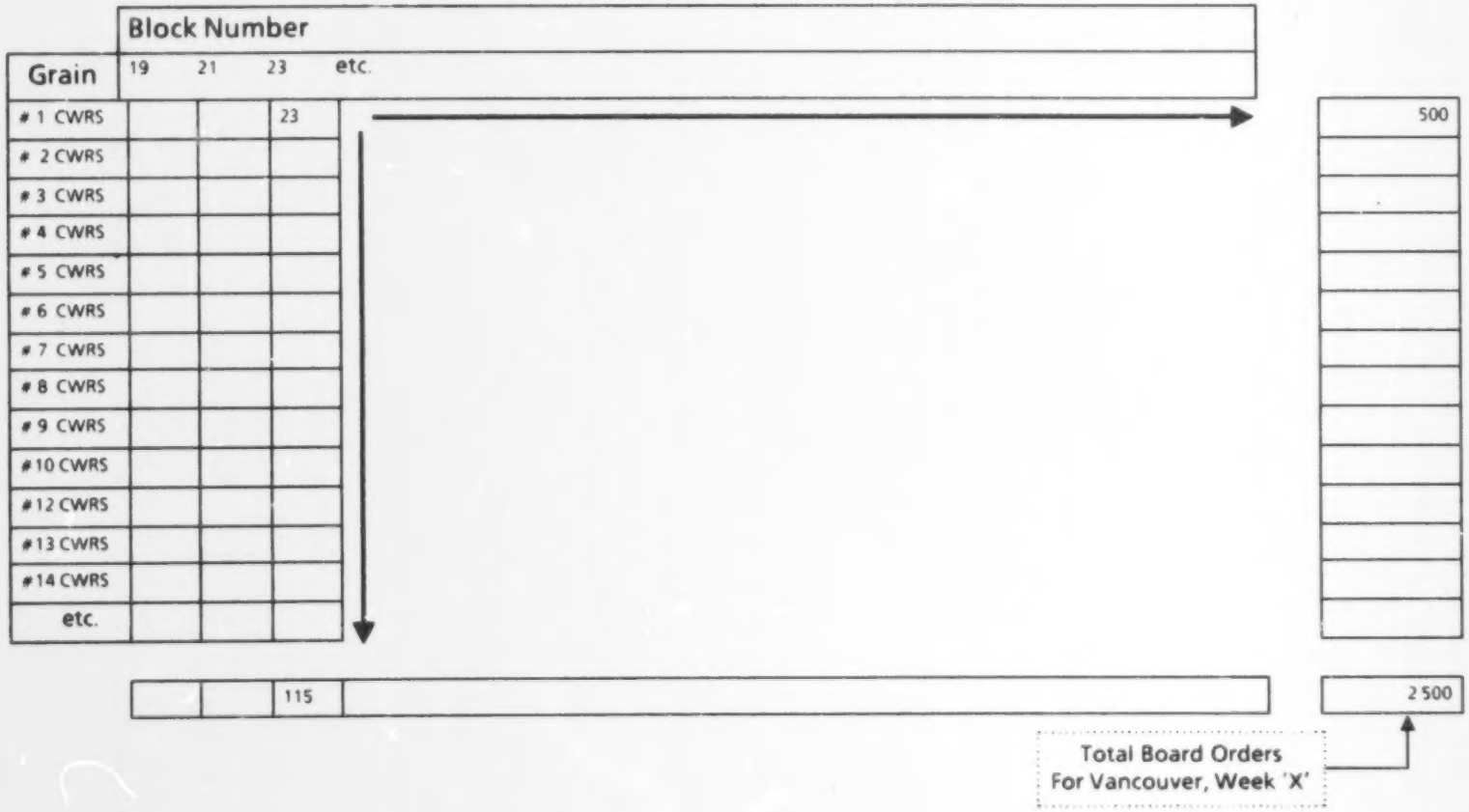
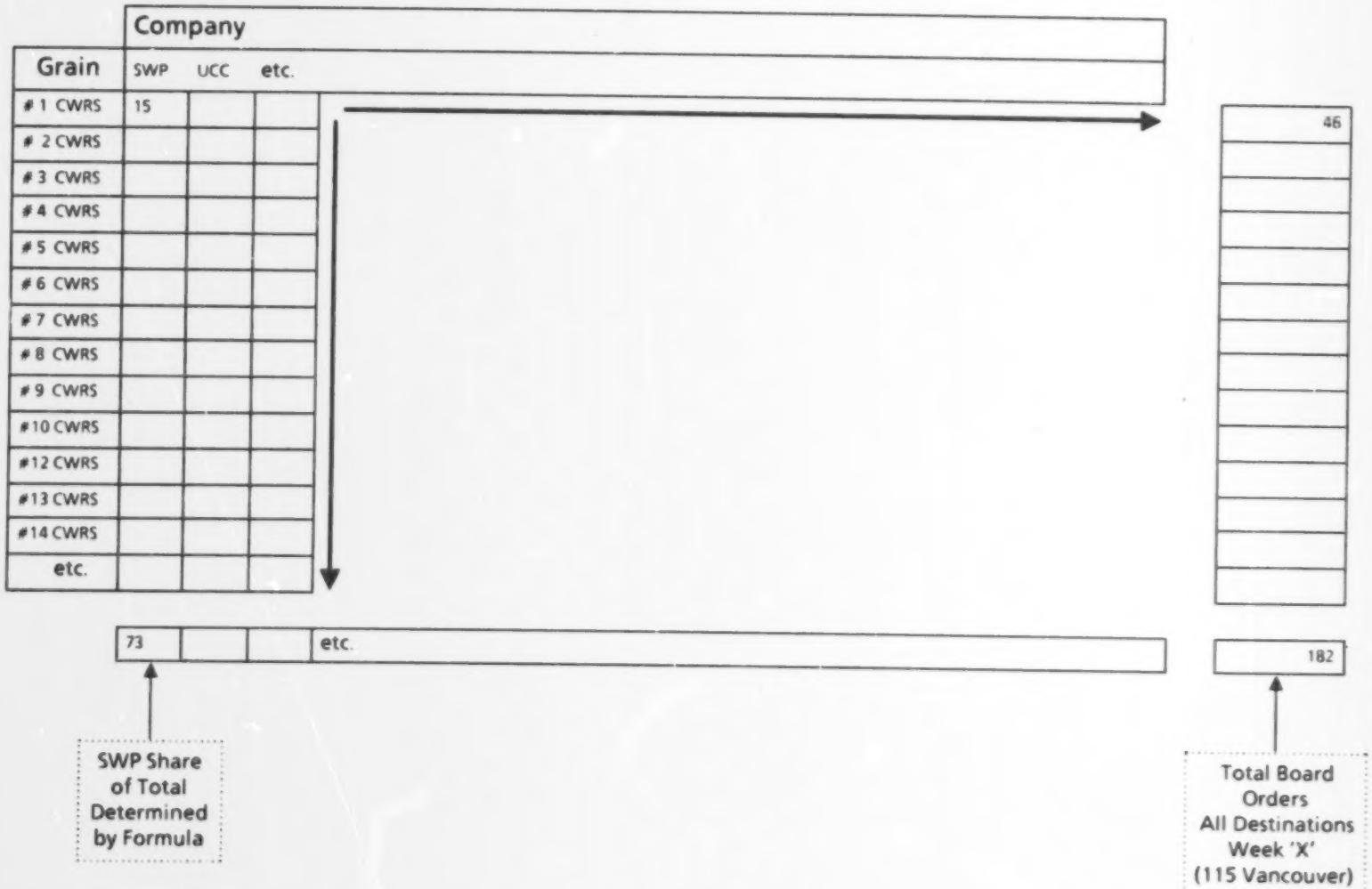


Figure 7
ALLOCATION OF BOARD ORDERS TO COMPANIES WITHIN BLOCKS



The Board fills in the new matrix when it allocates the orders to each individual shipper. Here, each column total represents the individual shipper and each column total represents the individual company's allocation in the block (determined, as discussed earlier, by the Bracken formula based on the company's percentage of handling).

The constraints that apply to each of these two echelons are not independent, and so a solution must either be obtained by an iterative method, or the two problems formulated together. The process does not stop here however, for there is a third echelon; each column in the matrix of Figure 7 becoming a similar problem wherein each column of the matrix to be filled in is an individual elevator. It must also be remembered that a similar set of matrices are being filled in for shipment to Thunder Bay, and the minima/maxima and stock constraints apply to total allocations (i.e., to both ports) from each block, company and elevator. Furthermore, there are miscellaneous shipments to mills and other domestic locations which also must be integrated into the program.

The thing which tends towards the amazing is that this system works (in the sense that the right grain usually does, more or less, get to terminal position as required to meet sales) notwithstanding that (a) these problems are solved using only the roughest kind of manual procedures to solve them, (b) the information base upon which decisions are made to order cars forward is poor, and (c) some of the assumptions made about the system's behavior are not valid.

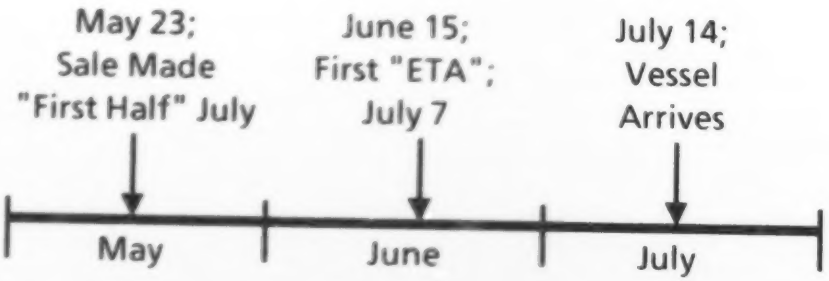
There are two major areas of uncertainty in this weekly planning process that deserve capital consideration: first, as to when vessels will arrive to take grain away from port terminals, and secondly as to when orders placed for the shipping of grain from country elevators will finally materialize as unloads at the port. Consider first the uncertainty of vessel arrivals. Sales contract periods are typically two weeks to a month long. Two examples are shown in Figure 8.

As illustrated by Example A, an exporter of non-Board grain will typically contract at the end of May for a cargo of grain in July. He will specify a "call period" such as "first half" or "last half" of the month. By about the middle of June he will actually nominate a vessel with an "Estimated Time of Arrival" (ETA) of July 10. The ETA will change two or three times (usually getting delayed) and in this case the vessel finally arrives July 14.

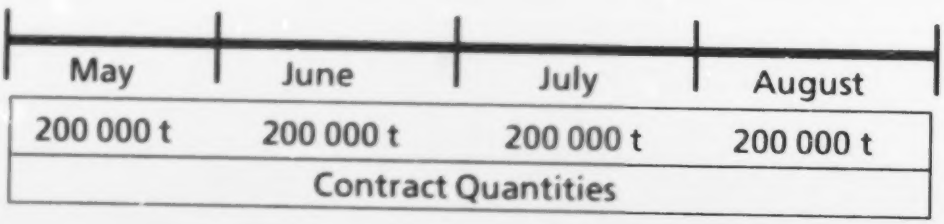
Example B represents the situation that prevails with large contracts of Boar grains to China or Russia. Typically, there will be a master contract calling for the export of a million tonnes of grain over a period of some months. The buyer will then subsequently indicate monthly quantities. These quantities are taken as sales "commitments" but in fact, the agreement is fairly loose. Vessels will be nominated two or three weeks in advance. Again, individual ETA's will change and the final shipping pattern may look something like the bottom line in the slide. With these contracts, there is typically a fairly large carry-over at the end of each month which is rolled over to become part of the following month's "commitment".

Figure 8
SALES CONTRACT PERIODS

Example 'A' **NON-BOARD SALE AT VANCOUVER**



Example 'B' **BOARD SALE, 3R WHEAT TO CHINA**



Vessel "ETA's":
May 10 - 60 000 t
May 12 - 30 000 t
May 20 - 50 000 t
May 23 - 50 000 t
Total 190 000 t

Vessel Arrival :
May 9 - 30 000 t
May 15 - 60 000 t
May 28 - 50 000 t
Total 140 000 t
(Carry Over: 60 000 t)

The key point to appreciate here is that reliable information about what will move and when is only available after the time that shipping orders must be placed in country positions.

The other area of uncertainty is on the rail side. This relates to the elapsed time between the placing of a shipping order and the arrival, at port, of a railcar of grain. Figure 9 shows how grain ordered to load in Week 5 actually arrives. It will be seen that some 8% actually arrives in the shipping week. This would represent cars spotted for loading early in the week at country elevators closest to the ports. Fully 10% does not arrive until five or more weeks after the shipping week.

Mention was made earlier of invalid assumptions about system operation, and one of the most critical is illustrated here. It is generally assumed that grain loaded one week will arrive in the next week. The assumption is illustrated by the two shaded bars in the figure. These amount to 38% of the grain ordered. Accordingly, more than half of the grain arrives later than assumed. Since the system is usually dealing with a fairly regular flow, in which the proportions of each grain and grade do not change dramatically from month to month, this erroneous assumption does not cause too much trouble. However, there have been a couple of dramatic disruptions caused at Prince Rupert, (where the grain handled usually consists of small volumes of a single train) where the Wheat Board has tried to switch from one grade to another, and has expected the system to react quickly. In the event, grain ordered against the old program came straggling in after the last vessel had left, taking up space required for the new product.

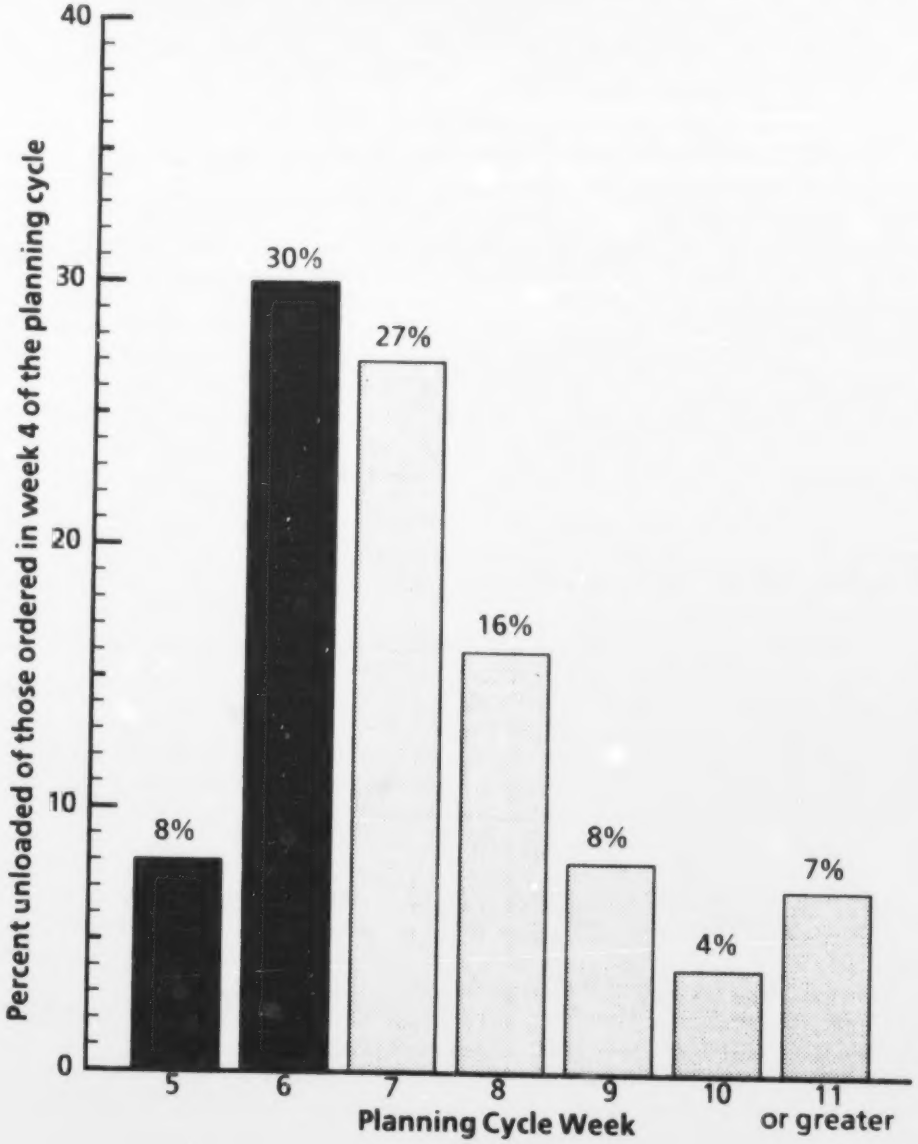
The foregoing should provide an overview of how the system functions and some of the day-to-day technical problems associated with its operation. Part II of the paper presents some historic background as to how this system evolved, and discusses some of the fundamental problems that have plagued the "car allocation" system, and made it such a contentious issue for many years.

II. ON MATTERS HISTORICAL, INSTITUTIONAL AND PROBLEMATICAL

The so-called "car allocation" system, (comprising, as earlier alluded to, both the allocative and logistical functions) is, in the author's view, the second of two "keystone" issues underlying the "grain transportation problem". (The first issue of course is the statutory rate.) There is a certain paradox about the logistics issue because on the one hand it has been very visible and pervasive while on the other, it is what may be called "the hidden issue" in the grain transportation problem. To explain: it has been highly visible under the name of "car allocation" (i.e., the process by which shippers are treated fairly), but the relationship between what is called "car allocation" and what is really logistics management has been little appreciated.

There is a considerable history to the matter, whose roots go back to the turn of the century. The issue first emerged in the 1890's when the CPR in spotting cars for loading, began to give preference to elevators over flat warehouses, because the elevators loaded cars more quickly. The matter

Figure 9
PERCENT OF CARS UNLOADED OF THOSE ORDERED (AVERAGE OF ALL PORTS)*



Legend: Adherence to Plan Deviation from Plan

* Source : Canadian Wheat Board Block Audit File , Three-month Sample, 1978.

was contentious enough to generate the standard Canadian response of a Royal Commission. The Commission's findings led to the passage of the Manitoba Grain Act which was the first piece of regulatory legislation governing the grain industry, and had in it sections that required the railways to distribute cars fairly. (This section was redundant, actually since such discrimination was already prohibited under The Railway Act.)

By the mid-fifties, a number of significant developments had occurred to make car allocation an entirely different kind of problem from that at the turn of the century. By this time, the Canadian Wheat Board was well established, and as agriculture recovered from the War, worldwide surpluses of grain began to accumulate. In Canada, faced with surplus stocks and depressed markets, the government, through the Canadian Wheat Board, acted to provide some income to the farmer by taking stocks into commercial storage. The elevator system, for a period of some years, was continually congested, while at the same time the farmer's ability to deliver was controlled under a quota system administered by the Board. In times when country elevators were plugged full of grain, it was clear that farmers could only deliver grain (and hence get some cash flow) after grain had been shipped out. Access to shipping is of course a function of the "car allocation" system. Since the Wheat Board was administering the quotas controlling inward movement, it was deemed only natural it should also decide where railway cars were placed and so began issuing shipping orders to control outward movement.

The shipping order system that prevailed in the fifties and sixties is something that simply boggles the mind of anyone who did not live with it. Its most peculiar feature was that something like four or five shipping orders were placed for every car of grain that was ever expected to be moved. To the obvious question of how such a system was able to move forward the right grain to meet sales, the answer is that, for the most part, it did not need to. Grain was sold, more or less, on an "off-the-shelf" basis. The bulk of the grain was moved to Thunder Bay and then down the lakes. Thunder Bay has a large storage capacity, and there, the grain was officially graded and made ready for export. Sales commitments were generally not made until the grain had reached terminal position.

However, marketing developments in the sixties changed all that. Three things occurred: first, total export volumes expanded with the big sales to Russia and China, and the system began to edge closer to operating at capacity. Second, the marketing system began to shift away from the off-the-shelf approach, towards long-term future commitments to deliver specific quantities of known quality at specific times. Third, sales expanded to Pacific rim countries, particularly China, and this made Vancouver a vastly more important port than it had been. At the West Coast, there is not the luxury of a large, mid-trip storage facility such as that at Thunder Bay.

Now, by 1960, a very difficult and complicated set of problems had developed. Because of a complex set of circumstances, (of which the statutory rates were one of the more important) the grain-handling and transportation system had not changed much since 1935. Not only had investment been lacking in the railway side, but in the handling sector, a modern elevator system had not emerged during the post-war years. Large sums had

been invested in facilities to store the surplus production of the fifties, but little in modern elevator facilities to handle grain. The system was accordingly ill-equipped to handle effectively the new demands placed upon it.

In the face of these circumstances, something had to be done, and the late sixties was a time of intensive self-examination on the part of the industry to reform and modernize. On the logistics management side, this resulted in the development of a new system for controlling the movement of grain from country to export position. It was called the "Block Shipping System" and among its more imaginative features was the principle that "an order means a car". This meant that a shipping order was not to be placed unless a railway car was to be spotted, and the grain needed to fulfill a sale.

The management of the "Block Shipping System" was assumed by the Wheat Board, partly because it had administered the old shipping order system, partly because it chaired the committee that devised the new system and partly because there was no other convenient body to do the job.

With the advent of the Block Shipping System and its management by the Wheat Board, two things happened. First, the regulatory function of "car allocation" -- i.e., the process of assuring fair and equitable access to available transportation -- became inseparably bound up with the logistics management function -- i.e., the process of moving the right grain to meet export commitments. Second, the Canadian Wheat Board, in managing the Block System, assumed an enormous amount of direct management control over the day-to-day operation of the grain companies and the railways. In its management of the new system, it was basically the Board that determined what grain was to move, from what areas of the country, and at what time and accordingly it gained enormous influence over which elevator companies were able to do business and when.* Furthermore, it began to determine much more precisely when and where the railways were to place cars. Now, there are two key points that must be understood if the impact of logistics management on the grain transportation problem is to be made clear:

First, not all grain in the West is marketed by the Canadian Wheat Board. Roughly 15% of the grain, namely the rye, flax and rapeseed for both domestic and export consumption plus wheat, oats and barley for domestic use, is marketed by the private grain trade. However, until the Grain Transportation Authority was set up in late 1979, the Board exercised the

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* It could be argued that the Board's power was as great as it had been under the old shipping order system as the new. However, the new precision of matching orders to cars in fact made the Board's control much tighter.

same day-to-day control over these grains (which are wheat, oats and barley for export).*

Second, the grain-handling industry is a competitive one with generally four major elevator companies and several smaller ones operating in each province, with each company competing for the farmer's business. The Board's control over transportation can have a significant role in determining the success or failure of each company's competitive efforts. If the company can't get the cars, it can't build or maintain its market share. As discussed in Part I of this paper, the Board is supposed to follow the Bracken formula for allocation of Board cars among country handlers, under which a company receives shipping orders in proportion to receipts; this procedure suffers from two drawbacks. First, the formula is often set aside because of the need to order the shipment of certain specific stocks of grains; second, the formula is extremely unresponsive and has been the subject of a great deal of dissatisfaction on the part of many of the handling companies.

If all grains were marketed by the Board, and if the grain-handling industry was a monopoly, there would not have been much wrong with the situation as it existed throughout the seventies. The "car allocation" function would be substantially simpler and less contentious since "fair and equitable access" would no longer be an issue of commercial importance to grain marketing and handling companies. However, given that a dual marketing system and a competitive elevator system are elements of national policy, and that the exercise of the quasi-regulatory function of car allocation can have a significant impact on the preservation of these institutions, then the body exercising the car allocation function can have no vested interests relative to either policy, and must have a suitable mandate, and be willing and able to invest the time and resources required for making these policies work. A strong case can be made that the Wheat Board fails to meet either of these requirements and accordingly the successful functioning of these elements of national policy was not properly provided for when the Board had sole jurisdiction over "car allocation".

Consider first the matter of the Board's vested interests. Although allocation of cars between Board and non-Board grains requires a strict impartiality (as well as considerable ingenuity and hard work to allow the two systems to share the same handling and transportation facilities), it is evident that the Wheat Board must have a conflict of interest if it manages the logistics system for both. Although there was a widespread

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* In fairness, it should be noted that of the total grain marketed, the proportion falling under the jurisdiction of the Wheat Board, was much higher in the post-war years, when the Board's role in car allocation first emerged, than it is today. In 1950, for example, rapeseed was almost non-existent and the marketing of domestic feed grain was a Board responsibility. During the 1950/51 crop year, 484 million bushels of grain (approximately 12 million tonnes) were shipped from country elevators, of which about 2% was non-Board. In 1980/1981, 26 million tonnes were shipped from country elevators of which 2.2 million was rye, flax and rapeseed, and something in excess of 1.5 million were non-Board feed grains.

feeling that having the combined responsibility caused the Board to be almost over-scrupulous in its dealings with the non-Board market, it is nevertheless arguable that Board employees and Commissioners cannot reconcile their obligation to the Board side of the market with an obligation to deal impartially between the two market channels.

Consider secondly, the responsibility to preserve the competitive nature of the grain-handling system. That there should be no artificial impediment to the functioning of a competitive grain-handling system is well founded in the history of "car allocation". In the fifties, there was a Commission of Inquiry on precisely this matter, which affirmed the basic principle that the grain producer has "the right to deliver to the elevator of his choice". This Commission (The Bracken Inquiry) gave birth to the so-called "Bracken formula" for "car allocation", and the Wheat Board was instructed to use this formula in its allocation of shipping orders among elevator companies. However, there is a deep-seated feeling among some of the handling companies that these particular allocation procedures have inhibited their competitive efforts, and that there is inadequate legislative or other discipline exerted on the Board to operate the allocation system so that there is no artificial impediment to their competitive efforts.

Arguably then, the Canadian Wheat Board was the wrong organization to have the pivotal role in "car allocation" which they acquired when the Block Shipping system was developed. However, that was not the only negative feature of the logistics management process. There were three additional major flaws in the system as it developed, and indeed, these flaws to a greater or lesser extent, still exist:

1. The requirement to get the right grain to the right place at the right time -- for Board grains -- is not translated into meaningful operational objectives for the grain-handling companies. (This is not true for non-Board grains, where they have the marketing responsibility and the corresponding incentives to assure that the grain is positioned for export.)

2. Too much responsibility for managing grain movement is centrally concentrated, to the point where the managerial abilities of the railways and grain companies is under-utilized.

3. To the extent that some responsibility must be assumed by a central authority, there is no adequate legislation under which to exercise this responsibility, and hence that central authority is neither limited in, nor in any effective way made accountable for, the power it exercised.

Consider the impact of each of these points on the effectiveness and responsiveness of the system. First, the lack of meaningful operational objectives: A grain-handling company's "objectives" in moving the Board's program is to load individual rail cars as the Board instructs. However, if the wrong grain moves to export position, it does not immediately manifest itself as a poor operational result for the company as it does if the wrong non-Board grain is moved, and the company's marketing position is

jeopardized. Accordingly, operating personnel are not judged on how well the basic task of getting the right grain to the right place at the right time is performed. It is true that there are the undesirable impacts on the companies' operations of failing to meet the Board's program -- congestion of rail yards and poor turnover in elevators -- but these do not give the operating personnel in the grain-handling companies the kind of incentives to build a responsive system that they would have if they had clear "bottom line" objectives with known rewards and penalties.*

The lack of direct objectives for line management in relation to Board movement often leads the grain handlers to make operational decisions which are not always in the interests of meeting the primary objective of getting the right grain into position when required. A dramatic example of the effect of this occurred in the late seventies. The Board needed no. 2 Wheat at Thunder Bay, but at the time the country elevators were congested with no. 3 Wheat. When the Board called for stocks of no. 2 to be reported, many of the elevator managers reported their no. 3 stocks as no. 2's. Accordingly, they were given orders to forward no. 2's, but instead shipped no. 3's in order to clear these stocks from their elevators. The fact that the no. 3 wheat was not required, and could both clog the terminals and jeopardize the sales program, were simply not compelling operational considerations. There is a penalty system to guard against this, whereby if an elevator manager ships the wrong grain, the company can lose future shipping orders, but if every company violates equally, the penalties are self-cancelling and the least flagrant violator can actually gain shipping orders. Amongst operating personnel, the objectives are to play penalties off against the need to keep elevators fluid, and to violate just a little less than the competition. Of course the impact of this lack of interest in Board movement is not confined to dramatic instances like this. It pervades the system on a week-by-week basis: non-Board grains are often shipped out of sequence, ahead of Board grains; misshipments (i.e., shipping grain of the wrong grade or type) tends to be much more common on Board grain because country elevator managers are not jeopardizing their companies' marketing positions by shipping the wrong goods.

The failure to provide clear operational objectives for the grain handlers gives rise directly to the second flaw. Because the grain handlers don't have the responsibility to get the Board's program into position, the Board itself must take this responsibility. Consider, again, an example: suppose the Canadian Wheat Board has a requirement to move 100 000 tonnes of no. 2 Red Spring Wheat of 12.5% protein to Vancouver for a sale, the first half of April. No one, outside the Board, will know that is what is required. This small, central group, in arranging and planning this movement, will attempt to manage this movement without involving the grain handler and the railways in the planning stage. Rarely will the handlers

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* In respect of this point, it is important to distinguish between policy and operations. There is no grain-handling company whose policy does not include full co-operation and support towards the Board's activities. What is being described here is something which impacts at the operational level. In the author's experience, it is something very real as the example given presently illustrates.

know that it is no. 2 Wheat that should be brought into position for shipping until the shipping orders are actually placed. Rarely is there any significant forward planning done with the railways to tell them that empty cars must be available in certain areas of the country, so many weeks hence, to effect the move. The Board attempts to plan and manage the movement of grain with little involvement of the actual operating entities.

In contrast, the grain-handling companies have an ideal organizational structure, if it were utilized, to effect such a movement. The larger companies have both country and terminal elevators; they have a chain of management command that reaches from port positions back down to the local country elevator; and they know, better than anyone, what stocks of grain are available in country positions, and how these stocks can best be brought forward. This organizational strength, however, is little used. The grain handler's role is confined to filling, under the Board's short-term instruction, so many rail cars in each "shipping block" with grain of certain specified quality and shipping them to specified ports.

It is not too strong an analogy to suggest that the present way of operating vis-à-vis the grain-handling companies is like hiring a carpenter and instructing him saw cut by saw cut and nail by nail, instead of asking him to build a staircase.

Of equal severity in its impact on system responsiveness is the third major flaw in the logistics system, viz, that the centralized transportation management function itself rests on very flimsy legal foundations. A consideration of history is again appropriate. At various times when "car allocation" had become a contentious issue, various clauses were inserted into legislation to give somebody or other the power to make sure that grain shippers receive "fair and equitable access" to available transportation. However, none of these clauses ever envisaged the kind of centralized management of grain movement that exists today, nor ever envisaged the integration of the regulatory function of ensuring "fair and equitable access" with the management function of moving the right grain forward to meet sales. Certain of the allocation procedures that are specifically described do not form part of the block shipping system procedures, while on the other hand, procedures now in effect are not mentioned. For example, section 21(k) of the Canadian Wheat Board Act gives the Board power to allocate cars available at a delivery point to shippers at that point. In fact, such a division of cars is not directly made. The equity principle to which this section was intended to give effect, is now applied by the Board at the shipping block level. On the other hand, nowhere is there specific reference to what is the most difficult and contentious allocation issue, the split between Board and non-Board grains.

Because there is no well-defined legislative framework, no set of regulations which define the "rules of the game" has ever been developed: who is responsible for what; what is and is not permissible; what are the consequences of breaking the rules? Nowhere are answers to these kinds of questions written down. The result is that the Wheat Board is able to exercise an enormous amount of ad hoc, discretionary power with little accountability. An example of how this power has been used would be illustrative. Some years ago there was a Canadian Grain Commission regula-

tion prohibiting stocks of non-Board feed grain in country elevators to exceed certain percentages. Quite suddenly, the Wheat Board decided that they were going to penalize the handling companies for violations of this regulation. Every car lot quantity held in store in excess of the specified maximums generated a "shipping penalty" -- meaning that the company would be denied car allocation for shipping domestic feed grains. The penalty provisions were made retroactive for some weeks, with the result that the Board had hundreds of shipping penalties to apply. For many subsequent weeks, whether a company could ship feed grains or not was purely at the whim of the Wheat Board transportation department.

There is, furthermore, partly in consequence of the lack of a legislative and regulatory framework, no "audit trail" on operating and allocation decisions.* For a grain-handling company which feels that it has not received its "fair share" -- either in respect of its Board or non-Board movement -- there are very little data available by which its apprehensions can be either proven or set at rest. Even if the data were available, there is no "court of appeal" in which matters can be reviewed. Although with the formation of the Grain Transportation Authority, this situation is beginning to change, it has hitherto been the case that it was the Board who decided who gets access to shipping, only the Board who really knew how shipping orders were allocated, only the Board who had access to the data upon which the decisions were based, the Board who knew whether it was done fairly and the Board to whom a company appealed if it thought it had not received fair treatment.

Finally, because the responsibilities and power of the "central co-ordinators" are not adequately laid out in legislation, the co-ordinating power has been exercised without adequate control or accountability. As a result, since the establishment of the block shipping system, the allocation and logistics management procedures have been increasingly characterized by erratic and seemingly capricious actions. Sudden changes to the rules, unpredictable applications of penalties and increasing complaints of an inability to communicate with the Board's transportation staff were all, in the author's view, direct manifestations of the exercise of power without accountability that resulted because of the inadequate legislative and regulatory definition of roles.

The existence of these factors and their impact on the responsiveness on the transportation system was discussed by the authors of the Booz-Allen & Hamilton, IBI Study which was completed for the federal government in 1979. This study was a major review of the operational details of the grain-handling and transportation system. In regards to the Board's conflict of interest and its management of car allocation they said:

> The conflicts of interest inherent in this role of the CWB seem to be more of a threat, than a reality. However, that threat coupled with the mystery which shrouds decision-making by the Block Shipping Staff

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* The Grain Transportation Authority, in the role it has taken in car allocation since 1980, has begun to correct this as will be discussed presently.

> creates tension and distrust among the participants. The lack of mutual trust frustrates improvements and fosters bureaucratic "blame-fixing." (Booz-Allen, page X-10)

And further that,

> The current operating relationship is strained between the CWB Block Shipping Staff, (operating in its present context as part of the CWB), and at least some of the grain companies. Lack of communication regarding forward plans, arbitrary changes in the car allocation to companies for non-Board grains, and retroactive imposition of car penalties, are some of the strong concerns expressed by company representatives in the context. (Ibid, page X-11)

On the lack of clear-cut objectives and the weak legislative and regulatory framework they concluded that:

> Given the number of participants, the dual marketing of Board and non-Board grains, and a common transport and handling system, the present management practices and interfaces do not permit the best operation of physical systems even under current constraints and loads. In particular:
>
> - responsibilities are not clear;
> - responsibilities are not placed where appropriate motivation exists to carry them out effectively;
> - objectives are not clear; there is no common understanding of goals; and
> - information and decision-making procedures are neither adequate nor do they look far enough ahead. (Ibid, page X-15).

It is certainly true that in 1979, working relationships among the members of the handling and transportation industry had fallen to a low ebb and there was considerable talk of the need for a "transportation czar" to sort things out. It is the author's view that the poor working relations, along with their adverse impacts on the system's operation, had developed over time, due largely to the problems in the logistics management system that are discussed here. The impact of these problems on the system's ability to respond are well documented in the Booz-Allen Report.

Following publication of the Booz-Allen Report, the government of the day, after consultation with the industry, established the Grain Transportation Authority with the following terms of reference:

1. To increase the grain-handling and transportation system's capacity to achieve a 1980 target of a 20% increase in exports

and a 1985 target of a 50% increase in exports (to 30 million tonnes);

2. To ensure that Prairie grain moves to domestic consumption and export positions in a prompt, efficient and orderly manner;

3. To secure the cooperation and participation of the industries concerned in providing the required transportation and handling services and facilities;

4. To carry out the required planning and to implement the changes necessary to make the forwarding system operate more efficiently and effectively, and to increase its capacity to meet the 1985 target of a 50% increase in exports; and

5. To keep all parties and the public fully informed about system operations and shortcomings.

The Grain Transportation Authority (GTA) has now assumed the very key part in the allocation process of dividing available railway cars between Board and non-Board grain. The GTA has spent a great deal of time and effort in defining new rules for this allocation procedure, and in developing an audit trail on the allocation decisions. While public disclosure of this kind of information is constrained by commercial confidentiality, documentation now exists which could be presented in confidence to a neutral third party to determine whether the allocation was done fairly and in accordance with the newly defined and documented procedures. Each individual company, moreover, has access to the audit trail on its own allocation, and can be shown much more clearly than ever before the way in which cars for its non-Board movement were allocated.

However, the GTA can do little to attack some of the fundamental problems. It is itself without a sound legislative foundation and does not have either the mandate or the power to attack the problems identified above.

III. ON THE EXPECTED IMPACT OF BILL C-155

Bill C-155 would introduce into the grain-handling and transportation industry, two major changes that would impact directly on the logistics issue:

1. It would create an Agency to replace the existing Grain Transportation Authority, and would give this Agency the legal foundation for it to be formally charged with "car allocation" functions; and

2. It would formally create a committee (the Senior Grain Transportation Committee) to which the new Agency will be, to some extent, accountable for its actions.

By so doing, Bill C-155 would go a long way to correcting some of the faults of the existing systems. In particular:

1. The new Agency would have the neutrality to allocate cars between the two competing marketing systems;*

2. The new Agency would be expected to have the required time and mandate and resources to develop an effective car allocation system; and

3. Through its relationship with the new Senior Grain Transportation Committee, there would be a curb placed on the exercise of power by the new Agency, and capricious or dictatorial attitudes would presumably be less likely to develop.

However, these steps would not be, in the author's view, sufficient. In order for the logistics system to develop so that it best serves the interests of the farmers and the industry, it is the author's view that the following developments must occur:

1. Decision-making and responsibility for forwarding the right grain must be decentralized. Neither the Wheat Board, the existing CTA, nor the new Agency can possibly acquire or assimilate the vast amount of information required to direct the movement of every individual carlot, nor, lacking direct authority over facilities and personnel, can they effectively get the job done. Rather, moving the right grain forward at the right time to meet sales must be translated into meaningful operating objectives for the grain handlers and the railways, and must allow for greater involvement of the grain handlers and railways in both the planning process, and the day-to-day operational decision-making;

2. Coordinating authorities and responsibilities must be properly defined, and delineated by an appropriate combination of legislation and regulation. Pursuant to the new legislation, clear-cut regulations must be developed which clearly set out the rules of the allocation procedures, establish audit trails on decisions and specify where the discretion of the "central coordinator" may and may not be exercised. (Good regulation, like good fences, makes good neighbours.) Furthermore, it must be made certain that the Agency's accountability to the industry, through the Senior Grain Transportation Committee is effective. The alternative is a continual growth in ad hoc, discretionary and unaccountable power in central bureaucracies. This in turn will inevitably lead to further erosion of the responsibility of the owners and operating officials of grain-handling and railway companies to manage, and a slow resurgence of the atmosphere of suspicion and antagonism which grew up over the seventies. This would further erode the ability of the system to do its job; and

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* The existing Grain Transportation Authority has the required neutrality, but its ability to take effective responsibility for allocation is restricted by its lack of legal foundation.

3. Finally, unless the logistics management system is altered so as to broaden the decision-making role of the operators, changes to the statutory rates will not allow for future evolution of the system. The grain handlers particularly must have some freedom to plan for the development of new facilities, and must be able to devise and implement business strategies to attract and handle the volume necessary to make their elevators viable. If excessive responsibility for management of movement is concentrated centrally, to the point where, as is now the case, a company's ability to attract grain deliveries is severely constrained by the "car allocation" process, the system will not evolve and change in response to farmers' needs and economic circumstances.

It is the author's hope that this paper shows how "grain transportation logistics" is not simply a technical issue. It's the historical, political, economic and sociological aspects that make working in the grain industry at once tremendously rewarding and accursedly frustrating.

VIA AND THE CTC

by

Pierre Franche
President and Chief Executive Officer
VIA Rail Canada

VIA AND THE CTC*

I hope there is no special reason why you invited me to speak to you on the eve of November 5. As you know, and as I learned, because I lived a year in Oxford, England, it was on that day in 1605 that the famous conspirator, Guy Fawkes, unsuccessfully attempted to blow up Britain's Houses of Parliament.

I hasten to assure you that there is no gunpowder plot in VIA directed against the CTC, nor against CN and CP for that matter. Nor will there be any fireworks, even verbal ones, in my remarks to you today. Equally, I hope that my observations do not seem to you to be a damp squib.

I hope this will help to throw light on some of our common problems and common goals at VIA and the CTC and provoke useful discussion of any apparent differences.

Many of these perceived differences may be attributable to our somewhat different vantage points and mandates. I approach my task with some trepidation because, as you may know, I have been in the railway business only a very short time. In fact, I have been present as Chief Executive Officer for one year as of the first of November, this week.

I am, by trade, a generalist manager and not a railway specialist of many years' standing like so many of the people in the audience. From everything I have seen in the last 16 months, the relationship between the CTC and VIA has been a remarkable and fruitful one. There is no question that it has contributed much to calming the troubled waters of passenger rail in Canada over the last few years, particularly since the birth of VIA.

Any achievements of ours in modernizing VIA would have been the smaller without the intervention of the CTC.

Today, I would like to put VIA before you in the context of a Crown corporation, for that is what it is, and discuss our corporate problems from that vantage point.

While VIA certainly has special problems of its own, peculiar to its specific mandate and its particular situation in the railway industry, many of the issues we confront are nevertheless common to Crown corporations as a whole. And now, as we know, Crown corporation policy is in a state of evolution and somewhat, therefore, subject to question. My observations on the general subject are my own views, based on some years as a manager in that milieu.

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* This paper was presented to the Canadian Transport Commission on January 28, 1983.

I would like to put it to you that managing a Crown corporation is somewhat like getting the worst of both public and private worlds. You have all the restrictions of the public sector, including the legislative and political constraints. More often than not, you also have to suffer under the stereotyped image the media almost daily lay on the Crowns, of inefficiency, careless attitude to the bottom line and all the rest that you can read in the newspapers.

Only the other day, for example, The Montréal Gazette managed to drag our annual deficit into a speculative story on our leasing new headquarters office space. Some of my staff are pretty mad at the headlines. Unfortunately, it has nothing to do with the situation.

Obviously, this fitted the editor's view of profligate Crown corporations renting plush highrise space while losing millions in taxpayers' money. The story did not say that the lease would save us millions over its life. The stereotype won out over reality.

Many people automatically expect Crown corporations to generate a profit if only because a profit is a customary measure of corporate success in the private sector. And they are disappointed if Crown corporations do not fit this mould and make money.

However, people close to the scene know that many Crown corporations are not totally free to pursue surplus or profit. They are often charged with projects, programs or products which the government considers in the national interest. The government believes these must be delivered, regardless of whether or not a surplus is possible, at charges which may be rather less than economic because they are dictated by non-business considerations. (The user-pay concept is not always followed to the limit.)

Thus, clothed in the garb of the corporate structure, a Crown is almost automatically seen to be a venture which is a failure if it does not, in fact, generate a surplus. It is then roundly criticized for this delinquency.

The misapprehension is probably a function of a number of factors. The accounting systems in a Crown corporation may not have separate profit and loss statements for each line of activity or product. Thus, the financial results do not indicate clearly which lines of endeavour may be profitable and which are clearly not. And because of this, there are not any indicators of where future profit may lie.

Another factor is the so-called "national interest" products or services. I refer to those lines of endeavour which the government has mandated the Crown corporation to manage often without first clearly stipulating the financial terms of reference for them. These activities are often essential to the national interest and may therefore be quite laudable, yet they may also be quite unable to generate a surplus even in the best of conditions. By definition, then, rendering these services is a public service as distinct from a truly commercial service rendered by a public body.

For want of a clear mandate and direction, then, a Crown corporation can well be pursuing several lines of endeavour. Some of these may be "profitable" (or can be) in the monetary sense and generate a surplus. Some of them may be profitable in the national interest but generate a deficit.

If these several sets of books are inextricably mixed together, the bottom line may be a loss or deficit. No one, including the government, may be quite clear on the source of the various profits and losses. All that is visible to the naked eye is that red ink on the ultimate bottom line. (We at VIA, by the way, are clear on which is which.)

Because "product accounting" or "brand accounting" is often not present, the Crown managers themselves often do not have an accurate picture of which activities are profitable and which are not. They have only guesstimates to guide their hands and that is not enough.

This makes it very hard to discuss usefully with government or public interest groups (or even regulatory bodies) which services should be discontinued or retained and which downgraded or upgraded.

A key tool of management is missing and crucial arguments needed for sponsors are unavailable. As a result, pressure to retain or restore unprofitable services is often successful because there is no accurate measure of the financial consequences. Indeed, there has often been no habit of thinking about questions in terms of profitability or loss — only less precisely in terms of the "national interest".

Crown corporations can also often be affected by several pieces of legislation, regulations and regulatory bodies which require them to act — or restrain them from acting — in a manner which does not necessarily fit a healthy bottom line.

Normal corporate imperatives are submerged or overlaid by other historical considerations which may have preceded the more modern bottom-line approach to delivering these products or services. The idea of a bottom-line approach to government services in Canada is a relatively new one. Often earlier legislation (which had the "national interest" rather than "profit" as its prime motivation) remains on the statute book to cause conflicts of direction between the "public" and "private" approach. These are often hard to resolve; change may take years, as you know, in the legislative process.

The concept of measuring the return on government capital investment is also relatively new. Time was when if government needed (and was seen to need) to invest $100 million for some public purpose, the payout was simply measured by benefit to the public rather than the rate of return of the capital at interest.

Yet today, all manners of Crown agencies are being required to demonstrate the financial validity and economic viability of their capital projects. They are being asked to do this, not merely in terms of benefits to their constituencies, but also in terms of their ability to return the borrowed money to the Consolidated Revenue Fund with interest.

Financial stringency today is increasing that pressure. (I may interject here that, as a professional manager in the public service, I welcome this trend just as I do as a taxpayer and citizen. After all, it is my money just as much as it is yours.)

Yet, in terms of their accounting and management control systems, Crowns may not be well-equipped to (literally) account for these capital funds, to pay them back and to demonstrate a healthy bottom line in so doing.

Good intentions are simply not enough today. Only detailed financial planning can make it really happen.

I believe taxpayers are looking for better management of public enterprises and I think they have the right to expect this even if the quality of management is by no means as bad as the media would have you believe.

Without segmented accounting — particularly where some services are profitable and others are not, yielding a deficit in the ultimate bottom line — it becomes very hard for Crown corporations to justify the very capital investment they may desperately need to turn themselves into "profitable" (or less unprofitable) operations.

The mélange of objectives, products and services with those older imperatives of the national interest and legislation overlaid on the profit or surplus motive make for confusion in Crown corporation management itself, in the parent departments, in the central agencies which control public investment, and in the minds of our political masters who ultimately represent the shareholders and from whom we seek to raise taxpayers' funds.

The lack of definitive "product accounting " is only a key symptom of the disease, however. The root illness is surely the frequent policy inability to define which products or services should be delivered at a surplus — in other words pay their way — and which should be delivered, if necessary, at a deficit in the national interest.

Yet, often a Crown corporation is the best vehicle to deliver both types of services rather than a line department which is generally concerned with services which are not destined to be self-financing. Often a Crown corporation is the only vehicle to deliver both "profitable" and "unprofitable" services. The private sector prefers winners to losers and private capital cannot be expected to finance purposes of the national interest where a profit is unlikely.

Without this fundamental decision-making — and the right financial information to assist in the process — Crown corporations often cannot find a positive and purposeful direction towards a surplus or at least a lower deficit.

The benefit of a corporate structure similar to that of the private sector, with the tool of a bottom-line to motivate and guide both management and employees is often, therefore, partially denied to Crown corporations. Instead, they wallow in the countervailing waves of pressures towards a

profit and pressures to serve their constituencies in the national interest, regardless of what happens to profitability. The result pleases no one.

I believe it is high time that we in Canada sorted out our thinking on Crown corporations and gave each a clear mandate on its financial direction.

Personally, I believe with conviction, that Crown corporations can play a most useful role in the Canadian economy, particularly where the private sector does not want to play that role or where it is inappropriate for the private sector to do so. However, clear courses must be charted for them so that they know what priority they must assign to the two kinds of bottom-line results I have described.

With these general observations on Crown corporations, I would now like to make some comments on a particular Crown corporation well-known to you: VIA Rail Canada Inc.

In this context, VIA displays some of the characteristics of the typical Crown corporation. First, it has a deficit of over $400 million a year, and with some $200 million a year additionally in capital investments.

Second, it provides a certain variety of services which, after modernization and service changes, may well turn out to be profitable.

Third, it provides a variety of services which are carried on in the national interest and which will probably never be profitable.

Today as you well know, throughout the world, passenger railway services are now generally provided by the state and are, with few exceptions, subsidized or unprofitable.

The exceptions include innovative high-speed railroads. Most Canadians today would probably agree that providing passenger-rail service is properly a public function. (Certainly we might have difficulty in finding private entrepreneurs to provide the service in Canada.)

Allow me, if you will, a brief moment to put in review some aspects of VIA's operations for you and our progress in modernization.

First, let me say that, in my view, if we were not now taking severe remedial measures, VIA's annual deficit would be $800 million or even a billion dollars by 1988 or even sooner — and that means the guillotine as far as I am concerned. And I value my neck too much to allow that to happen.

We are taking many measures to survive and we need the support and understanding of the CTC in this matter.

VIA may be one of the least efficient companies of its kind in the industrialized world, expressed in terms of subsidy and productivity and we simply cannot let that continue.

The situation is changing, as it must. Perhaps we can all agree that VIA was created in a climate of urgency. There was no extensive and

well-informed public discussion of the practicalities of managing a rail-passenger service separately from freight operations.

However, a management solely dedicated to serving passengers obviously was (and is) the only way to go. Institutional structures such as service discontinuance hearings by the CTC and Costing Order R-6313 are still in place. Added to them were improvisations such as the operating agreements with CN and CP and subsidiary service requests from the government. Not much was new except VIA itself.

And in addition, long-established, obsolete and costly labour arrangements remained, adding their toll on costs, as they still do to this day. We are just now starting, hopefully with the cooperation of organized labour, to bring a measure of modern productivity and economic good sense to staffing arrangements on our trains.

Similar reforms are being pursued in the area of vehicle maintenance. We are optimistic that the unions will support sensible measures.

The new corporation certainly started life with its quota of problems, many of which we, at VIA, are still addressing.

For example, you could say that VIA got all the losing assets at its birth. Other valuable assets such as stations did not come with the basic responsibility of running the passenger-rail service.

VIA will be making a comprehensive proposal to the government on station ownership in the months ahead. There is an important principle at stake here: he who owns the assets calls the tune. We consider ownership of many of the physical facilities VIA uses to be a key dimension in VIA's long-term corporate plan. We need ownership to ensure proper accountability, productivity, cost control and operational integrity. Onwership will safeguard the overall autonomy and integrity of rail-passenger services in Canada.

This need applies to all those assets peculiar to the rail-passenger service, but not to right-of-way, for example, unless this is dedicated mostly to passenger train use.

It is important to differentiate between VIA and the two other railways. Their objectives are quite understandably to optimize their performance in freight transportation for an industrial market. They want to make the most profitable use of their assets. VIA, however, must provide passenger transportation for a mass-market and reduce its costs to the lowest possible level. These objectives are often in conflict. VIA needs to be able to pursue its mandate as a priority. This can only be achieved through ownership of passenger assets.

All three railways seek excellence in providing freight or passenger service to Canadians. Each must ensure that priority is given to its own field of endeavour. A clear and distinct separation of freight and passenger responsibilities and resources assures each corporation that it is free to pursue its own and often divergent objectives. Then each railway can be held accountable, by its shareholders, for its own activities and results.

However, despite these pieces of unfinished business, VIA has also recently begun to realize certain of the efficiencies for which we have been striving since its birth.

We have been working away at the bottom line, that traditional measure of corporate success. We have begun to curtail our requirements for subsidy from the government. The 1981 subsidy increased 27.5% over 1980. In 1982, the increase was 7.6%, and this year we estimate the increase will total 5%. Next year, we should see a further reduction to about 3.5% and, in fact, next year — and also this year — if we had not had to absorb in our operating deficit a certain party of second-time-around backshopping, we would have had a reduction in our deficit both in 1983 and 1984.

The subsidy per passenger per year varies considerably, depending on the service type; 1981 information indicates that for remote services, the subsidy was $188 per passenger.

For transcontinental, the subsidy was $125 per passenger. For intercity and local services, the subsidy was $42 per passenger. For corridor services between Québec and Windsor, the subsidy was $25.

As we can see, not all VIA service types are equal in terms of the deficits they generate. In just over five years, VIA has, I believe, taken significant steps towards reversing almost four decades of decline in the passenger-rail service.

It has established the organizational structure needed to manage a unified national system of rail-passenger transportation. In 1983, the structure has been further streamlined for greater efficiency and accountability.

VIA has completely overhauled and refurbished virtually all of the aging locomotives and cars we acquired from CP and CN.

It has consolidated and simplified the fare structure.

It has implemented an aggressive marketing and advertising program which has brought a new image to rail-passenger travel and established the VIA name and logotype as symbols recognized across Canada.

It has started to treat its markets on an individual basis, backed up by market research to identify the profile and preferences of customers in each of them.

It has developed and implemented a new reservation system, called Reservia, making reservations and ticketing much faster and more convenient and permitting better control over equipment use. This system was expanded and updated in mid-1983.

It has extended VIA-1 first class service, which began in 1980, to all Rapido trains in the Québec/Windsor corridor, making VIA more competitive in the business travel market.

It has taken delivery of and introduced an initial order of new LRC (light, rapid and comfortable) trains: 50 cars and 21 locomotives. A second order of LRCs — another 50 cars and 10 locomotives — has now begun delivery and this will be completed by early 1985.

It has matched train size more closely to actual demand, raising occupancy from 35% to 51%.

It has renegotiated the operating agreements with CN and CP to obtain improvements to management information and cost control systems, additional workload and cost information, and detailed reviews of station operating costs, yard-switching practices, equipment maintenance costs and other things.

It has designed and constructed a new pilot maintenance facility to prove out and introduce modern maintenance techniques, open in Montréal in 1983. (We still maintain the majority of our equipment in open-air yards, winter and summer.)

It has developed a proposal to build its own maintenance facilities.

It has instilled a "bottom-line" management philosophy.

It has developed detailed plans setting out further improvements to be made over the next five years.

It has carried forward a study of options for passenger-rail development in the Québec/Windsor corridor. The study will be completed very shortly. A similar study for the Edmonton/Calgary corridor is contained in the main study.

It is launching a major effort aimed at improving service to VIA customers, which will include extensive training for VIA employees in dealing with all our customers.

It is developing a plan for better use of stations, as noted earlier.

And it is implementing better facilities for handicapped passengers. These are no mean achievements, as I have discovered over these last 16 months. Change in something as inflexible as a railway is neither simple, cheap, nor easy. Modernization is complex, costly and constrained by many factors.

One interesting fact is that VIA is the largest tour operator selling Canada as a destination. In 1978, VIA carried 36 000 passengers on its tour programs. By last year, this figure had risen to 76 000 passengers, an increase of 211%. Between 1978 and 1982, VIA carried over 250 000 tour passengers in Canada, many of whom were foreign visitors. In 1978, our gross revenues from these customers totalled $1.5 million. Last year, the tour traffic we carried produced VIA revenues of $5.5 million which is a 366% increase and that is only our revenues. There are quite a few economic spin-offs to the tourist industry from these tours.

Just a little example for those of you who are opera lovers: last year Pavarrroti came to the Forum in Montréal. I had a call from L'Orchestre Symphonique de Montréal who said: "Franche, can you organize something? We have got to put about 15 000 people into the Forum." Within a week, we had put out a flier to all our customers — we know their affinity — "the cultural customers", and within two weeks we had sold 500 tickets in the Forum. At the end, when the concert occurred, out of 15 000 customers, VIA had 1 492 paying customers in the Forum that came from outside Montréal by train. That evening in Montréal, we occupied 500 hotel rooms because we sold it as a package. That is an example of some of the things that occur very quickly.

So in many ways, therefore, VIA's effort to modernize are beginning to pay off. Let us look at one major route. In 1976, the year the government announced a new policy which led to the creation of VIA, passenger trains carried 1.1 million passengers between Toronto and Montréal. By 1982, the figure was over 1.6 million or an increase of almost 50%. To absorb such an increase, airlines would have had to fly an additional 5 000 flights annually between the two cities. The cost, both in dollars and increased airport congestion, would have been enormous.

Like other Crown corporations, VIA is deep in governing legislation and ruled considerably by the decisions of this regulatory body, the Canadian Transport Commission. The Minister of Transport provides us with long-term policy direction. Through Transport Canada and its Surface Administration, we relate to the Treasury Board and the Ministry of State for Economic and Regional Development. We pay out two-thirds of our total expenditures to two major suppliers (one of which is, itself, a Crown corporation: CN), each of which is the only supplier for the services we purchase.

Up to the present, it would be true to say that we in VIA management have little or no control over that two-thirds of our expenditures, although negotiations have now started to change this. I can tell there has been quite an improvement on that. We feel a lot more at ease now.

For what it is worth, I would also note that for the one-third of expenses VIA does control, we have never been over budget in the last four years.

I believe VIA suffers under certain psychological disadvantages not common to other modes of transportation. That $600-million-a-year government subsidy to VIA is right out in the open. It is the difference between the revenue we bring in and our costs. The government pays it rather publicly. It is very visible.

We lose that much money a year, at least that is the way everyone perceives it. In a corporate structure, that government subsidy tends to give us an automatic blackeye, or should I call it a redeye, due to the red ink?

Of course, there is no form of public transportation which, in itself, is financially viable and free from subsidy. All modes receive some public subsidy, some from several levels of government. But only passenger-rail is really right up front, for all to see.

The airlines, of course, get less obvious government subsidies through airports, navigation and meteorological services. Buses and the private automobile (and the latter, the automobile, is VIA's biggest competitor) in effect, enjoy the subsidies implicit on our state-built roads.

I said our subsidies are highly visible. They come from a single source. Some of the other modes are subsidized by several levels of government and these funds are therefore harder to identify. Our more visible subsidies undoubtedly contribute somewhat to a negative image for passenger-rail which would not really seem quite so justified if everyone realized clearly how big the subsidies are to the other modes.

Also, the subsidies on the various types of passenger-rail services vary enormously, as I have indicated earlier. Some services are markedly less unprofitable than others and have good financial potential in our view. They can provide a sound financial base on which to build.

I do not want to leave you with any misinterpretation. I still think that the rail-passenger service is the most subsidized of all the modes at the moment. That is clear in my mind. I do not accept it, but that is what it is.

Also, reflect on the investment mind-set typical of freight by rail. Mindful of economic effects with the change in the Crow's Nest Pass rate, the government is contemplating the expenditure of millions and millions of dollars in upgrading those westbound rail tracks to provide better freight service for our resource-based industries. Nobody calls that investment a subsidy. They would not dare. Here the public interest demands support for important elements in our economy.

The Senate Standing Committee on Transportation and Communications put it well last year, and I quote:

> "A modern and attractive railway passenger system can, and should continue to play an important part in Canada's transportation future. A comfortable railway passenger system which is well utilized by the travelling public can provide an energy-efficient and cost-efficient method of intercity travel. Passenger rail service is an economical and prudent investment when compared to the very high costs of subsidies indeed to underwrite the construction and maintenance of facilities for air and road transportation."

The Senate Committee really does have a point, for other countries are investing billions in passenger-rail and producing high-speed passenger train routes which are moving a growing number of passengers by the thousands.

We have only to think of the highly-successful French Train de Grande Vitesse or the Japanese Shinkansen. Canada's vast geographical base, relative lack of centres of high population density, and virtually unique east/west travel patterns may mitigate against the installation of identical systems Canada-wide.

But I believe we simply must, nevertheless, look to the experience of our overseas counterparts in terms of providing convenient high-speed passenger-train services where they are both appropriate and cost-effective.

VIA's coming report to the government will discuss the options. (In mentioning this work, I must thank the CTC warmly for making Ken Mozersky available as a member of our Corridor Review Committee and express thanks to him for his input and cooperation.)

Yet, here in Canada, where the passenger train is evidently an emotional, visceral part of our national history, we sometimes still seem to be wondering whether passenger rail is a good idea at all anymore. I do not share those doubts.

With the Senate Committee, I believe, the Canadian travelling public is entitled to a convenient choice of modes of travel. We are one such choice. In an operating sense, VIA sometimes seems to be in almost a no-win situation. This is not so much because of the business we are in but because of the way we have to do business under the inheritance of the past.

The railways' costs are governed by Costing Order R-6313 made by the CTC, which came about from the need to identify costs when the government began to subsidize branch line passenger rail services. When VIA was created, we adapted to this through our operating agreements as the method of setting CN and CP charges to VIA.

As you know, R-6313 was the only tested method of determining and verifying railway costs. In our view, after years of experience, we believe it does not altogether encourage productivity and efficiency. It was developed to allocate costs between divisions within CN or CP. While the principle of long-term variable costs can be fully acceptable to VIA, we find that as a result of shared costs, the costs of passenger service can vary according to the volume of freight business. It would be interesting for the CTC to conduct research into current applications of this fundamental principle. I recognize, of course, that the CTC recently conducted a comparison of AMTRAK and VIA's costing approaches. This indicated that if VIA were to use a more rigorous application of the avoidable cost approach, savings would result. This is an example of the kind of problem which may well merit research by the CTC, which is worth pursuing — and for which only the CTC has the necessary base information.

The imbalance between the expenses we can control and those we largely cannot — one-third to two-thirds — means that VIA management does not have a great deal of room to manoeuvre. While we say we cannot, let me tell you we are working pretty hard on the two-thirds aspect to control it by different means. We are striving to change this.

We believe we should be more in control of the factors affecting our company's destiny and, of course, be held accountable for it. We think a customer-oriented management ought to be mainly responsible for deciding how we should satisfy the needs of our customers. And a management dedicated solely to passenger rail is not forced to choose between the attractions of profits from freight and the less attractive carriage of passengers.

VIA speaks for the passenger, not the shipper. Our customer loyalties are therefore not divided. Sometimes, however, it seems to be almost as if everyone but VIA management is responsible for VIA's course. (By way of example, I hope VIA will always be so responsive to customers' needs that it will not be necessary for the CTC to order us to undertake experimental services. If we are truly marketing-oriented, truly attuned to our customers' needs, we should anticipate you, not follow you.)

I believe some of these issues and other important concerns should be addressed by the VIA Rail Act which has often been discussed and recommended in Parliament.

Like the Senate Standing Committee on Transportation and Communications, we really need a clear and all-encompassing legislative framework.

I believe a VIA, reinforced by a specific legislative mandate, is the best custodian of the interests of rail passengers in Canada. We can speak better for the rail passenger with a VIA Rail Act at our back.

Earlier I referred to the need for close knowledge of what various services and products cost — and which were profitable and which were not. This is an area on which we, at VIA, are focusing real attention. We simply must view our activities by segment and not as one large ball of wax. The totality of our services is simply indecipherable from a management point of view.

In modernizing, we have to look at the components, not just the whole. We have divided the types of services we run four ways.

First, our corridor services operate in markets with high potential in traffic size and density. They are generally characterized by several trains a day, operating at relatively high speeds. All the services which definitely justify this description are in the region between Québec and Windsor. They have been the subject of a multi-year, multi-million-dollar study which is now being completed and which includes a Calgary/Edmonton route.

Secondly, transcontinental services provide direct service linking all regions. In practice, long distance is only part of this market. Trips between the smaller cities and communities along the route are also significant. Their national nature, however, has given transcontinental services a unique significance in terms of government policies promoting tourism and national unity. Much emotion is attached to them. They are also highly unprofitable.

We are studying the overall future of the transcontinental service and its subsequent re-equipment. My description of the Transcon is very simple. In business, if you are a hotel-owner you have a lot of trouble making money. When you take the hotel and shove it on wheels, please do not ask us to do what the other fellow can do when it sits on the ground. That is one of the difficulties of the transcontinental service: it is a hotel on wheels.

Third, regional/intercity services are a very varied category. Some join major centres; others link a series of small communities to one major centre, such as the Yarmouth/Halifax train. Service is generally once or twice a day, at speeds slower than the corridor services. A few of these routes, such as Calgary/Edmonton, may have a large enough potential to justify corridor-type service in the future. They are being carefully investigated. At the moment all these routes lose money.

Remote services provide access to and between communities where alternate transportation is limited or non-existent. The potential market is small because of sparse population. These services generally operate three times a week or less, stopping frequently and travelling at relatively low speeds. Again, all these services lose money.

There are major differences in the financial performance, market penetration and customer needs in these four service types. Remote services have the lowest occupancy and the poorest financial performance on a percentage basis because the markets they serve are so very limited.

Transcontinental services have the largest dollar losses because of the need to provide complete sleeper and meal services year-round over great distances: my concept of the hotel on wheels.

Corridor services have relatively high revenue-cost ratios and the greatest potential to achieve financial viability.

These four service types are so diverse that lumping them all together represents a very distorted picture of both VIA's current performance and the future potential of passenger-rail service in this country. Each must be separately considered, route by route and train by train. Only then can an accurate "national" picture be built up from these widely-differing components.

The truth is that there really is no such thing as a national picture. There is only the summation of these individual "regional" or segmental pictures.

(Now you can see why I believe so strongly that segmented accounting must be available as a tool for management. It is not merely another interesting view of the same subject for the financial people. It is much more than a technical accounting issue. Management simply cannot make good decisions without it. In the case of VIA, and in many other corporations, this information is essential to plot short-, middle- and long-term strategy and the necessary remedial measures. At VIA, we are working to improve the precision of this aspect of our accounting.)

With information you can develop sound objectives. There needs to be more specific objectives for each of VIA's four service types. With corridor services, where the public has a choice of transportation option, financial viability is a critical test of VIA's performance in the long term.

We believe a modernized corridor service can earn back the investment it will require, as well as providing a key transportation facility in Canada, in an almost totally new dimension: high-speed rail.

In this light, I would say that the CTC, at this stage, must protect existing corridors and rights-of-way while this study is being completed and decisions are taken. Other services are provided for policy reasons, such as national unity, social equity or tourism development. VIA has to meet whatever standards government sets for such services at the lowest possible cost to the public.

With the right information, VIA can tell the government accurately what the "national interest" costs. (Increasingly, we are having success in getting more meaningful cost data from the railways to help us do this and we value their cooperation. We feel that a demonstrably avoidable cost approach may be what VIA needs.)

VIA's five-year business plan, in fact, refines our objectives into detailed costs, revenue and operational targets by service category and route. Without this route-by-route analysis and control, our annual deficit levels could easily escalate considerably. With careful breakouts, VIA management can exercise control and give better information to the CTC.

As a result, VIA is now developing a sophisticated management information system which will enable us to do this.

Here is how our current business plan actually defines our objectives:

First, it specifies a particular revenue/cost ratio and sets the ceiling on the net operating loss.

Secondly, for services, it specifies for in the corridor, self-sufficiency in the long term with interim targets for revenue cost/ratios and loss ceilings.

For the transcontinental, that it provides efficient service at minimum cost according to government-specified service levels with a ceiling on the operating loss.

For remote services, that they be retained at least cost, as directed by government, again, with a ceiling on the loss.

For regional/intercity, that they be managed in such a manner as to minimize costs to meet government-specified service levels with a loss ceiling.

Thirdly, we also wish to establish a legal and contractual framework conducive to achieving corporate objectives, such as legislation.

Fourth, we have to achieve effective control over rail costs by renegotiating the operating agreements, developing maintenance centre and owning assets.

The objectives, obviously, are longer than this. These, however, are the key items. They are developed in some detail for each type of service. Implicit in our whole approach to carrying out these business plan objectives is the marketing approach. This has been briefly defined as the

total process of satisfying the customers' needs at a profit. The whole impetus of VIA is being turned to marketing, seeking to orient our whole organization to satisfying customer needs for passenger-rail service.

And, to get at the core of the problem, we are focusing particularly on face-to-face service to the customer. We will shortly be launching a very comprehensive yet down-to-earth customer service program, in which we will be zeroing in on training for face-to-face contact between VIA employees and their customers, as well as, hopefully, reaching the many CN and CP employees who are in contact with our customers on our trains.

This customer service initiative will have at its core a thoughtful, custom-tailored training program which will eventually reach out to every VIA employee who comes anywhere near a customer and, by good internal communication, even touch those employees who do not. Each of us at VIA can be customer-oriented in our approach to our jobs: a message I am conveying to our employees at all levels.

Coupled with an overall marketing strategy which views our entire corporate process in terms of customer satisfaction, we are convinced we can bring people back to the train and keep them as customers. I am reminded of the words of Theodore Levitt, the prophet of marketing, who said more than 20 years ago, and I quote:

> "The organization must learn to think of itself not as producing goods or services but as buying customers, as doing the things that will make people want to do business with them."

In this regard, we see VIA as primarily serving a chain of regional transportation markets across Canada, rather than a homogeneous national market. We are therefore tailoring our "products" (frequency, type of equipment, reservations capability) to these individual markets, rather than seeking to impose on the customer, the components of a single "national product". This, after all, is responsive marketing. I hope you will agree, from what I have said, that VIA is very much a Crown corporation confronted by the dual imperatives of making a profit and yet serving the national interest. That can create a conflict within our corporation, with Transport Canada, with the CTC, with the central agencies and finally, with our sponsors.

Of course, everybody wants us to reduce our deficit and cut our losses. Because delivery of our service is expressed in corporate (or profit-and-loss) terms on a corporate financial statement, that is the natural order of things. At the same time, people want us to provide all sorts of services in the public interest, whether they are economically justified or not. Passenger rail is thought of as a public service! This is a contradiction which confronts the CTC, too, in its regulatory role.

Because we are a Crown corporation, people expect us to provide these money-losing services. Yet, because our service is rendered from within a corporate framework, we are measured by the rules of the private sector and a profit is expected — and there is some outrage when it is not

delivered. Therefore, I suggest VIA Rail is a good example of the dilemma we all face in Canada with many Crown corporations.

Our operating statement is covered in red ink, but the service we provide is considered essential by government and the public.

If the service is essential, yet costly, you may well ask: "Franche, why bother with the profit-centred approach? Just take the necessary subsidies and get on with the task of managing your railway as efficiently as you possibly can, holding down the level of subsidies as much as possible.

"Since you are certified to be serving a valid social purpose, why bother with profit?. How do you measure profit anyway?"

To me, that approach would be a licence to mismanage. Even if VIA were never to make it fully into the black, we as its managers would still need the discipline of the bottom line to govern our actions. This discipline restrains, or moulds, the huge investment decisions we are called upon to make and provides the incentive to reform and change those outmoded management and labour practices characteristic of a highly tradition-bound industry.

We have recently streamlined our management complement as part of an approach to reducing labour costs. We need the spur of profit — or the spur of reducing losses, if you like, — to innovate, particularly in marketing, vehicle maintenance and management generally, as well as in modernizing our labour arrangements in many areas. To guide our hands as we search for modern vehicles and infrastructure for the twenty-first century, we must be able to keep score on our work. And to me, the profit-and-loss statement is the only sure way to do this. To make our relationships with CN and CP more productive — since their bills account for two-thirds of our cost — both sides need the discipline of the profit-and-loss measurement.

Profit and loss, after all, provides the yardstick by which most managers are measured. I simply do not see how you can properly exempt Crown corporation management from this test of their efficiency. In fact, you should not do so, in my view.

It is true that I may, for the moment, measure VIA's success by how much we can reduce the government subsidy or by how much we can prevent it from growing. But that, nevertheless, remains a valid test of my skills as a manager and the efficiency of our whole management team at VIA. It also tells our employees the economic facts of life and brings reality to all of us, management and labour, as we negotiate together.

The bottom line is an important reference point for both of us. As I have indicated earlier, however, the profit-centred approach in a Crown corporation does, in fact, provide much more than just a method of keeping score. The entrepreneurial philosophy can begin to permeate to every corner of the organization, infusing marketing plans, capital investment or management of day-to-day operations, all of which can be more effective because they have bottom-line objectives. With business plans, operations are oriented to greater efficiency and effectiveness.

That, then, is the real utility of the profit-orientation. It exacts better performance even when totally profitable performance is impossible, distant, or simply not appropriate. I believe that some degree of "commercialization" is appropriate to almost every Crown corporation, if management is to have the necessary spur to be fully responsive to its customers and potential customers, to innovate and to deliver its products or services at the lowest possible cost consistent with efficiency and effectiveness.

Certainly, you have to resolve the conflicts and apparent contradictions I have indicated between profit and the national interest. I believe you can do it much more effectively from a commercial base — where the bottom-line is always staring you in the face. Both the CTC and VIA are, in effect, custodians of the public interest, though from somewhat different vantage points. We share the common goal of providing the rail passengers of Canada with the best possible service at the lowest possible cost.

We welcome your understanding and collaboration in this important task. Your knowledge and expertise can continue to be invaluable in the national task of modernizing and revivifying Canada's national passenger railway service. Our responsibility, and we cannot escape this corporately, is to manage the service in an efficient, effective and economical manner so that Canadians, who are our shareholders, can see through Parliament that their funds are producing a proper return — however that may be defined — and that the public is properly serviced.